

ART REEVES

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ART REEVES
MOTION PICTURE EQUIPMENT
7512 SANTA MONICA BLVD.
HOLLYWOOD, CALIF, U.S.A.



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International

PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS
Hollywood, California

Vol. 9

No. 12

ART REEVES
MOTION PICTURE EQUIPMENT
7512 SANTA MONICA BLVD.
HOLLYWOOD, CALIF. U.S.A.



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 and Elizabeth Meyer.

◆
Current Releases

CAROLE LOMBARD and FREDRIC MARCH in "NOTHING
 SACRED," a comedy in Technicolor by Ben Hecht, with Charles
 Winninger and Walter Connolly; directed by William A. Wellman.

"THE PRISONER OF ZENDA," starring RONALD COLMAN,
 with Madeleine Carroll and Douglas Fairbanks, Jr. Screen play by
 John L. Balderston; adaptation by Wells Root and additional dia-
 logue by Donald Ogden Stewart. Directed by John Cromwell.

"A STAR IS BORN," starring JANET GAYNOR and FREDRIC
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 Directed by William A. Wellman.

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ON THE COVER

The excellent picture of Edgar Bergen, and his vocal if inanimate little pal, Charlie McCarthy, on the front cover of this issue, is from the set of stills by Robert Coburn, member of Local 659, IATSE, for Samuel Goldwyn's "Goldwyn Follies" in which the Chase & Sanborn radio show favorites reach top billing on the screen. Bergen already has made a series of shorts for Warners and is under contract to Universal for feature pictures.

Bergen's success is due to his special skill as a comedy material writer, although he was well-known in vaudeville for years before the talkies and the radio and its own inertia sent that entertainment medium into a fatal decline. Although, after the downfall of the variety shows and presentations, Bergen had made a new success for himself by adapting his ventriloquistic skill to night club entertainment, to Rudy Vallee and his famed Thursday night broadcast, goes credit for the real discovery of Bergen's talents.

Like many another, Bergen and "Charlie" went on from the Vallee program to set a new national vogue on the Chase & Sanborn show and finally land among the screen's aces.

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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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SNOOP
With Pictures to LOOK

BUBBLE BLOWER (See Page 1)

OLD POKER FACE (See Page 5)

TRANSATLANTIC WHATNOT (See Page 7)

PIE-EYED PIRATE (See Page 15)

A PICTORIAL PREVIEW OF PARAMOUNT PRODUCTIONS
Published Every Once in a While by Paramount Pictures, Inc., 1501 Broadway, N. Y. C.



"WHAT'S ALL THE SHOOTIN' FER?"

If Ed of known this Frank Lloyd teller was going to make the fight injuries and desperados all through this Wells Fargo poster of his, Ed of never signed up. Gosh! He's got me scared in death.

Right. Bob Burns, minus his famed banana, has just arrived at the Wells Fargo poster of his, Ed of never signed up. Gosh! He's got me scared in death.



5

BLONDE OR BRUNETTE...She's Still the Nation's Pet!



Mae West Leads "EVERY DAY'S A HOLIDAY" Before the Cameras

Out of her favorite period in the history of man, America's roaring Nineties, when music-he clips were in their prime and the Can Can was in flower, Mae has fashioned this "best of the West" with an all-star supporting cast featuring Edmund Lowe and five of the greatest screen comics—Charlie Butterworth, Charles Winninger, Walter Catlett, Herman Bing—and

Chetler Cooklin—not to mention music by Louis Armstrong and the sensational production number "New Year's Eve at Rectory." Extra added attraction—Mae in one part of the picture foreshadows the brunettes for the brunettes, going yaree-varee French as the black tressed Mme. Fili from Paree see battered toast of New York.

19

Geel! But I hate to Get Up in the Morning. The Candid camera catches the early morning tragedy of a hardworking picture star



6:00 A.M.



6:03 A.M.



6:10 A.M.



6:01 A.M.



6:02 A.M.



6:02 1/2 A.M.



The Guy's a Hero!

20

HOUSE ORGAN FOR CANDID SHOTS is "Snoop," new Paramount Pictures quarterly publication aimed to sell candid shots of Paramount's outstanding product to editors, exchange and theatre men, first issue of which appeared last month. Terry DeLapp, studio publicist has armed his stillmen with Contax cameras and conducted a campaign of educating the studio's personalities to the value and convenience of properly made candid shots. Assembling of the material, in neat, effective layouts was supervised by Robert M. Gillham, Paramount's director

of advertising and publicity in New York. At Paramount the candid pictures are serviced to editors and news services by Rufus Blair. A standard procedure of 8" x 10" enlargements from the 35mm. negative is followed. Front cover shot of W. C. Fields was enlarged from a natural color Kodachrome 35mm. negative. While Paramount's enlargements from the candid shots are aimed particularly at the slick paper publications and rotogravure, the studio stillmen are turning out much work that will stand newsprint reproduction.

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

Tradewinds

News of New Products

Although December brought no huge rush of new products due to concentration on the holiday season sales rush, such items as the new Super Sport Dolly and new Super Ikonta B model cameras, a new General Electric exposure meter, a new Filmosound and film cement from Bell & Howell, another new flashlamp from Wabash, and a new film rewind from Cinema-Arts-Crafts highlighted the new products. International Photographer also acknowledges the receipt of samples of Infinol and Champlin's Formula No. 15, use of which by IATSE studio technicians, will be reported in coming issues.

Initial response to the new Tradewinds section, from both readers and manufacturers has been gratifying. We have tried to get blanks for submission of new product in standard form to all those making products used in photography or the motion picture industry. It is our sincere wish that any firm that has not received blanks as yet will make use of the reprint appearing on Page 6 of this issue and by forwarding a news item of some new product will automatically be placed on our mailing list to receive blanks in the future.—Ed.

CINEMATOGRAPHY

NAME OF PRODUCT: New B&H Filmosounds.
MANUFACTURER: Bell & Howell Co., 1801 Larchmont Ave., Chicago, Ill.
DISTRIBUTOR: Sold direct, dealers.

GENERAL DESCRIPTION: Bell & Howell now is producing four standard models in connection with announcement of general improvements throughout entire line of Filmosounds. New features, lend greater flexibility, although maintaining same basic engineering principles of previous models.

SPECIFICATIONS: Numerous combinations and price levels are too detailed for condensed publication here. We suggest interested parties contact dealers for information on the four new models: 750-watt Filmosound 120-G; the 138-F; the 138-J; and the newest improved Filmosound, the powerful 1000-watt Auditorium model.

NAME OF PRODUCT: B & H Universal Film Cement.

MANUFACTURER: Bell & Howell Co., 1801 Larchmont Avenue, Chicago, Ill.
DISTRIBUTOR: Sold direct, dealers.

GENERAL DESCRIPTION: Developed after months of research combines the virtues of both B & H safety and standard film cements, which it supercedes. Makers claim it forms splices stronger than the film itself.

SPECIFICATIONS: Since most 16mm. and 8mm film is of the safety or acetate type, and most standard film is on nitrate bases, new cement is convenient and certain for both. Universal usefulness as a result of new secret formula is big asset.

PRICES: According to quantity.

PRODUCT: Agfa Supreme Negative Film.
MANUFACTURER: Agfa Ansco Corporation, 29 Charles St., Binghamton, New York.

DISTRIBUTOR: C. King Charney, Incorporated, 6424 Santa Monica Blvd., Hollywood, California, (Hollywood 2918).

GENERAL DESCRIPTION: A new 35mm. motion

picture negative film which is fully two times as fast as Agfa Superpan negative. Supreme negative has a much finer grain size than Superpan and is slightly more brilliant. The color sensitivity is practically identical with regular Superpan negative. Supreme negative may be processed in any photographic developer which is satisfactory for use with regular super-sensitive panchromatic negative emulsions. The keeping quality of SUPREME negative is fully equal to that of Agfa Superpan negative. The new SUPREME negative

Stop Press Flash

Every still photographer and executive concerned with color photography will be interested in the appearance late this month of a new single mirror three color one shot special back for 5"x7" and 8"x10" view cameras, which will be marketed by the Thomas S. Curtis Laboratories at \$150. It gets three-color separations from the same spectral emulsion as is manufactured by Defender to Dr. Curtis's formulas for use with his expensive Type "K" color cameras. New back will be known as Type "M" and will be demonstrated at the studios by Don Hooper, member of Local 683, I.A.T.S.E., who is handling studio contacts for the Curtis organization. Full details on the back will be published as a highlight of the Tradewinds section in our February issue.

is designed for general and special production uses.

SPECIFICATIONS: Width 35mm, standard perforation, 200 foot, 400 foot, 1000 foot lengths.
PRICE: .04c per foot.

PRODUCT: Agfa Ultra Speed Pan Negative Film.

MANUFACTURER: Agfa Ansco Corporation, 29 Charles St., Binghamton, New York.

DISTRIBUTOR: C. King Charney, Incorporated, 6424 Santa Monica Blvd., Hollywood, California, (Hollywood 2918).

GENERAL DESCRIPTION: Ultra Speed 35mm. motion picture negative is an extremely high speed material intended for newsreel photography and special studio photography under adverse conditions. Ultra Speed is fully three to four times faster than Agfa Superpan negative. The gradation is slightly flatter than Superpan and with the exception of being a little higher in the red region of the spectrum has a color sensitivity comparable with Superpan. Ultra Speed has a slightly coarser grain size than Superpan, but this condition will not be found objectionable for most practical applications. The keeping quality of Ultra Speed is fully equal to that of Superpan. Ultra Speed may be processed in any photographic developer that is satisfactory for use with super-sensitive panchromatic emulsions.

SPECIFICATIONS: Width 35mm, standard perforations, 200 foot, 400 foot, 1000 foot lengths.
PRICE: .05c per foot.

LABORATORY

PRODUCT: Model AA-1 35mm. Rewind.
MANUFACTURER: Cinema Arts-Crafts, Fairfax Ave., Hollywood, Calif. (HEmpstead 1984).
DISTRIBUTOR: (Same).

GENERAL DESCRIPTION: The new Cinema Arts-Crafts Model AA-1 Rewind has been engineered for the studios of today. It has many new modern features using the finest materials obtainable. The Rewind casting is made of cast aluminum. The gears are made of bronze and chrome vanadium steel. Bronze and roller bearings are used. The handle is well counter-balanced and does not tire the operator's arm. Takes up 2,000 foot reels, and winds in the direction turned.

SPECIFICATIONS: Capacity, 2,000 foot reels. Materials—Aluminum, Bronze, Chrome Vanadium Steel and Roller Bearings.

PRICES: One at a time, \$20.00; two at a time, \$18.00; 6 or more at a time, \$15.00.

PHOTOGRAPHY

PRODUCT: General Electric Exposure Meter.
MANUFACTURER: General Electric Co., Schenectady, N. Y.

DISTRIBUTOR: (Same).

GENERAL DESCRIPTION: Claimed to have many

new features, the new meter is intended for use with both black-and-white and color. With a wide range of ability to read light intensities, from dim interiors to brightest sunlight, the instrument is compact, of modern design, accurate and easy to use.

SPECIFICATIONS: Directional hood shades out overhead and side light, locks and slides into position. When closed hood gives complete protection to photo-electric cell and face of instrument. Needle scale appears in a hori-

zontal window on the top side of housing.
PRICE: \$19.50.

PRODUCT: Superflash No. 1.
MANUFACTURER: Wabash Photolamp Corp.,
335 Carroll St., Brooklyn, N. Y.

DISTRIBUTOR: Sold direct, dealers.

GENERAL DESCRIPTION: Guaranteed by manufacturers for perfect foolproof synchronizing at high shutter speeds, particularly when used

with new fast Agfa films, this new flash bulb from Wabash is hailed as smallest bulb ever made. Makers claim twelve will fit in a coat pocket, and that routine shots at 1/200th of a second produce brilliant, snappy negatives with lens stopped down to f:32 and f:45. Also claimed to synchronize effectively with focal plane shutters. So great has been demand for these new bulbs company is enlarging production facilities.

SPECIFICATIONS: Peak of flash in new midget

Technical Jury New Product Record Blank

NAME OF PRODUCT:

MANUFACTURER:

(Street)

(City)

(State)

(Telephone)

DISTRIBUTOR:

(Street)

(City)

(State)

(Telephone)

GENERAL DESCRIPTION:

State purpose, aims and claims for product)

SPECIFICATIONS:

(State size, dimensions, materials, standard accessories, etc.)

PRICES:

MODEL NUMBER:

(State if supersedes previous Model Number)

☐ **PICTURES:** If pictures of product are mailed under separate cover, mark check in the box. Good quality gloss prints, preferably 8" x 10" are welcome and afford additional excellent publicity for your product. Since these are news pictures, we prefer unretouched photographs. If any persons appear in pictures be sure to identify with legible captions reading from left to right.

Technical Jury,
International Photographer,
506 Taft Building,
Hollywood, California.

Gentlemen:

We are sending you under separate cover our.....
for inspection and use under actual production conditions.

☐ This item is worth less than \$10.00 and may be destroyed or kept by you.

☐ This item is worth more than \$10.00 and is still saleable after your inspection. Hence we expect its return after a reasonable period, but we assume all costs of insuring against loss and understand that International Photographer assumes no responsibility for loss or damage to the product.

.....
(Signature of authorized executive or agent of manufacturer or distributor.)



bulb has been lengthened as in Standard No. 2 and No. 3 Superflash, as recently announced. Safety Spot protection. Packed in individual wrappers, 6 to the package and 120 bulbs to the case.
PRICE: \$0.20.

PRODUCT: Victor Hi-Lo Switches. (6 amp., 20 amp., 40 amp.)

MANUFACTURER: James H. Smith & Sons Corp., Lake & Colfax Sts., Griffith, Indiana. (Griffith 136).

DISTRIBUTOR: (Same).

GENERAL DESCRIPTION: Aimed to prolong lamp life and to save electricity, these switches provide means of burning Photoflood or Mazda lamps at half voltage during non-operative periods. When the setup is arranged a snap of the switch will throw lamps from half voltage to full voltage, or entirely off. With lamps at half voltage, illumination is comfortable for focusing and arranging lighting and subjects. Many lamp combinations can be used, up to 1000-watt size.

SPECIFICATIONS: Made of durable high grade materials, with Belden rubber plug and receptacles attached. Comes in three models as listed below by price. With switches may be purchased Tee-Taps for \$0.90 each, and 20-foot lengths of high-grade extension cord of No. 18 sheathed heater cord, with Belden rubber plug and receptacles attached.

PRICES: 6 amp., \$3.25; 20 amp., \$7.50; 40 amp., \$16.50.

PRODUCT: Kodak ABC Darkroom Outfit.

MANUFACTURER: Eastman Kodak Co., Rochester, N. Y.

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: Aimed to facilitate education of amateurs in darkroom technique, this new outfit contains all the basic materials needed for beginning the home darkroom. (See story on Page 12.) The kit serves for negatives up to $3\frac{1}{2}'' \times 5\frac{1}{2}''$. Kit sells for considerably less than if units were purchased separately and is designed to help rookie amateur avoid difficulties and errors in initial darkroom experience.

SPECIFICATIONS: Neatly packaged, kit contains: Brownie Darkroom Lamp, Model A; 4-ounce graduate; three $4'' \times 6''$ developing trays; one-half pound package Kodak Acid Fixing Powder; three tubes Eastman Universal Developer; two dozen sheets Velvet Velox Paper, Contrast No. 3, Size $3\frac{1}{2}'' \times 5\frac{1}{2}''$; two Kodak Junior Film clips; glass stirring rod; Eastman printing frame and glass, and complete instruction booklet.

PRICE: \$2.25.

PRODUCT: Super Sport Dolly Camera.

MANUFACTURER: Certo, Dresden, Germany.

DISTRIBUTOR: Burleigh Brooks, New York, N.Y.

GENERAL DESCRIPTION: Latest item in the Dolly series is equipped with built-in, dependable, lens-synchronized range-finder on the split image principle. Staunchly and ruggedly constructed, it is very compact. Has self-erecting closed front, front lens focusing up to 5 ft. (lens and shutter both move instead of merely front element of lens). Optical eye-level view-



finder has mask so constructed that it is compensated for both picture sizes. Features extreme loading ease.

SPECIFICATIONS: Finished in fine grain leather, designed to streamline effect. Edges and struts highly nicked. Genuine leather bellows. Hyperfocal distance table on back of camera. Makes either 16 pictures $1\frac{3}{4}'' \times 2\frac{1}{4}''$ inches or 12 pictures $2\frac{1}{4}'' \times 2\frac{1}{4}''$ inches. Weight, 24 oz.

PRICES: Obtainable with Schneider Xenar f:2.8 lens in delayed action Compur Shutter with speeds up to $1/250$ th at \$65; same optical equipment in Rapid Compur Shutter with speeds to $1/400$ th at \$70; also Zeiss Tessar f:2.8 lens in Delayed Compur at \$82.50. Rapid Compur at \$87.50.

PRODUCT: Argus Slidekit, Binder Kit and Projector.

MANUFACTURER: International Research Corp., Ann Arbor, Mich.

DISTRIBUTOR: Sold direct, dealers.

GENERAL DESCRIPTION: These items are intended to be sold as a unit, although the other items can be purchased separately from the \$15 projector. Their aim is to provide low cost facilities for mounting, binding and projecting black-and-white and color shots.

SPECIFICATIONS: The Slidekit and Binder are simple and efficient, designed for easy and rapid mounting of pictures, as illustrated. Pro-

jector is of modernistic design, a powerful precision instrument, with special 100-watt projection lamp, full color, corrected four-inch focal lens, complete with slide carrier.

jector is of modernistic design, a powerful precision instrument, with special 100-watt projection lamp, full color, corrected four-inch focal lens, complete with slide carrier.

PRODUCT: New Super Ikonta B.

MANUFACTURER: Zeiss-Ikon, Dresden, Germany.

DISTRIBUTOR: Carl Zeiss, Inc., 485 5th Avenue, New York City.

GENERAL DESCRIPTION: The new model Super Ikonta B now features the same as the Contax models, the range- and view-finders combined in one large opening. This obviously adds to the speed and ease of focusing and centering the picture, especially when rapid action is required.

SPECIFICATIONS: New model is identical in all other respects to the previous Super Ikonta B, shooting $11\frac{1}{2}'' \times 2\frac{1}{4}''$ pictures on No. 120 roll film.

PRICE: \$150, with Zeiss Tessar f:2.8 lens in Rapid Compur shutter to $1/400$ second.

R & P Still Lab Open

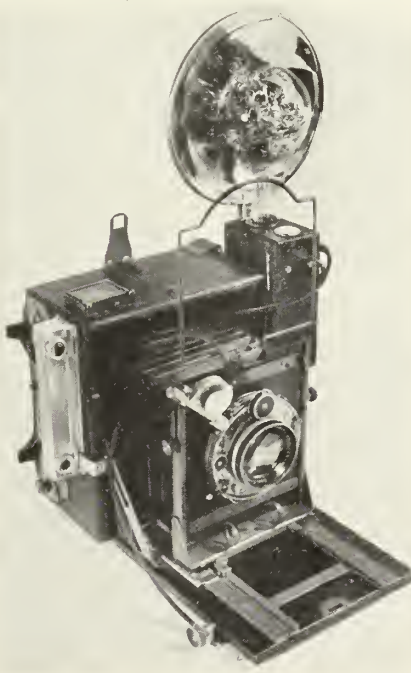
Parrish and Reay operating complete still service for independent studios and publicity directors.

Equipping of a new and modern plant for the handling of all still department activities has been completed by Neville Reay, motion picture publicity and advertising executive for ten years, and Fred A. Parrish, still photographer and member of Local 659, who has been shooting celebrities for 15 years at all the studios.

The new company is called R & P Laboratories and offers the independent producer and publicity director full laboratory facilities, including negative developing, negative duping and enlarging, printing, enlarging, copying, and, for the production department, preparation of material for process work.

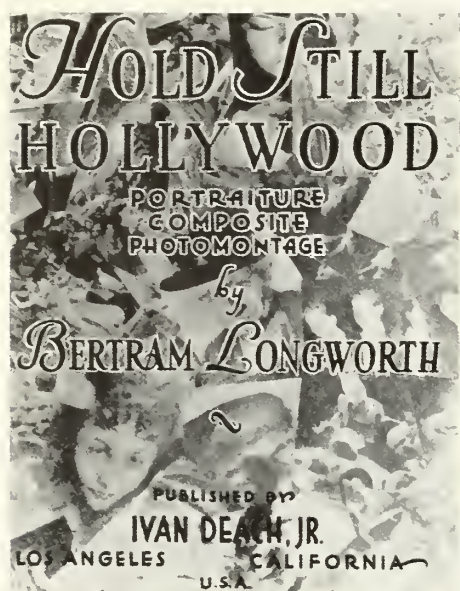
The company already is handling stills for five major independents. Free pickup and delivery service is maintained. A night shift is steadily employed so that proofs of each day's work may be delivered in the early morning. R. & P. Laboratories temporary telephone is Hillside 3947.

While Reay and Parrish are partners in the enterprise, they each will continue their own work and will employ a 100 percent union staff from Local 683, IATSE, to handle the processing work.



MICROMATIC SYNCHRONIZER, illustrated above, is the professional model of the new Kalart series, described in last month's Tradewinds. Model shown sells for \$16, and has a 9-volt battery case. This flash synchronizer has had a sensational sales success in the past few months, since it came on the market, due to its great adaptability to many sizes and types of cameras.

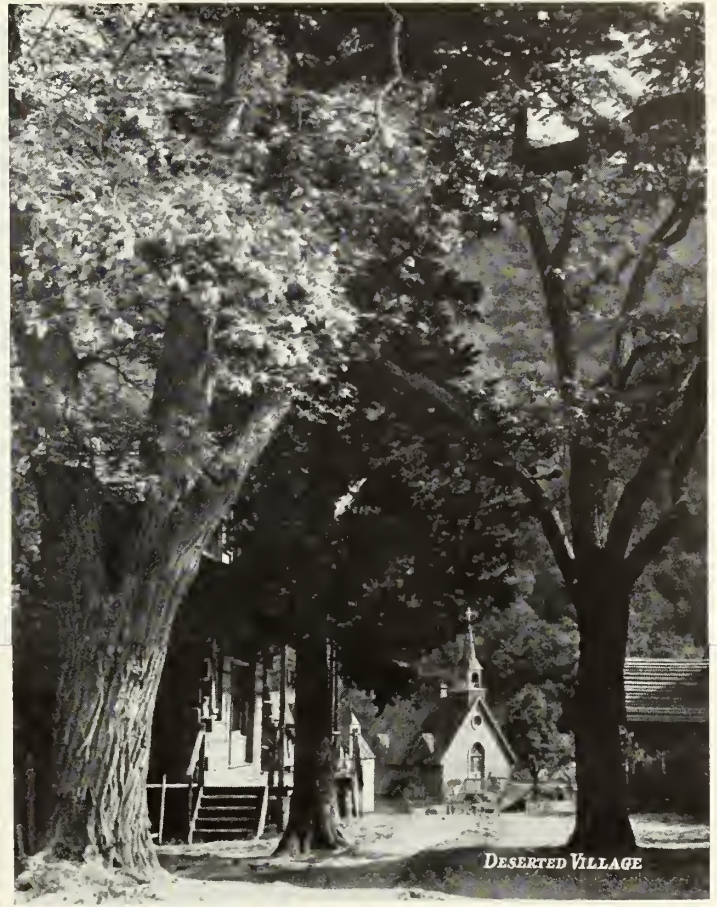
CAMERA



On this and opposite page are direct reproductions from the original prints of outstanding shots from new Longworth book.



ROMAN HALL



DESERTED VILLAGE

1938's Prospects for Stillmen

Publication by Longworth of outstanding collection of studio stills prompts discussion on ways of opening up new opportunities to improve still photography.

(Herbert Aller, managing editor of International Photographer, also is Secretary of International Photographers Local 659, IATSE. In this capacity he comes in direct contact with more photographers than any person in Hollywood. His comments contain an inter-

esting follow-up on the pertinent criticism of the studio still situation by John LeRoy Johnston, veteran studio publicity man, in the September issue of International Photographer.—Ed.)

For the first time in some years, one

of Hollywood's army of ace stillmen, members of Local 659, presents in publication form a gathering together of his outstanding work. Bert Longworth is the photographer and the publication is his "Hold Still, Hollywood," (highlights from which are illustrated on these pages) which has evoked much favorable comment since its appearance several weeks ago. This achievement by the veteran stillman, who is known particularly to the folks of the Warners lot, serves to bring out in sharp contrast the results obtained under favorable conditions by the expert Hollywood still photographer and the usual



NAUTCH



GRAVEYARD



TUNNEL OF BEAUTY



experience of the average worker under the present still photography setup in the major studios.

There is no question but that there is room for considerable improvement in this field of motion picture photographic work. The subject was opened up very ably from a critical standpoint by the veteran Hollywood publicist, John LeRoy Johnston, in an article published in the September, 1937, issue of *International Photographer*.

While I thoroughly agree with Mr. Johnston's premise that the still situation in Hollywood suffers from the heavy hand of conservative tradition in the equipment available, there is noticeable on various fronts, steps to improve this condition. However, many of the problems involved, as I have discovered in conversations with experienced stillmen, prompted by the points made in Mr. Johnston's article, are of method and routine, and these depend upon the human equation rather than better cameras, faster lenses or new super films.

It is my belief that an open and thorough discussion of the methods and practices now in vogue—from a frankly critical standpoint—with the aim of im-

ACTION! One of Local 659's most popular members, veteran first cameraman Hal Mohr, snapped on the set of a recent Walter Wanger production, with "Jockey" Feindel, veteran Local 659 second cameraman at the controls.

proving the quality and news value of stills emanating from Hollywood, is well worth while. This might well eventually take the shape of informal periodical discussions of the subject between cameramen and executives with whom they work. Presentation of these viewpoints is made with the hope that it will stimulate further discussion, both from stillmen and publicity men.

In the ranks of our stillmen in the motion pictures industry, we have many outstanding photographic workers. To mention a few in addition to Longworth, the names of George Hurrell, Ray Jones, Clarence Bull, Gene Kornman, Whitey Schafer, Ted Allen, Cliff Maupin, Frank Powolny, Romann Freulich, Bob Coburn, Alex Kahle, Fred Parrish and Ernest Bachrach, come easily to mind because their work has appeared in recent issues of *International Photographer* as well as in many a national publication. Many more could be mentioned

but this sample groups represents every type of skilled still photography from the subtle angles of capturing personality to the tricks of sharp action photography.

Yet these experienced stillmen—with the possible exceptions of Hurrell, Schafer and Jones—have comparatively little to say about their work after the original negatives are tossed into the publicity machine hopper. A situation has developed where decisions are constantly being made upon the manner of handling a negative without any attempt to correlate this with the aims and objectives in the mind of the man who snapped the shutter. This naturally is resulting in much waste motion and bad photography.

Our studio stillmen, if given the same cooperation that is accorded the widely publicized artistic geniuses of photography in the employ of the big publications, and if given some sort of voice as to what the finished and accepted still print will be, would be capable of turning out work of a much higher calibre.

For one thing they are closer to the work than most of their bosses and they shoot things at certain angles, speeds and stops for definite reasons, yet most of the time they are not given the opportunity to present those reasons when stills are selected. Thousands of stills are shot week in and week out during the course of the year that go to waste because the heads of the departments who choose the finished stills do not have the time to go over them with their stillmen, who should be able to make valuable suggestions on the handling of prints.

To the average head of a still department a negative is looked at for its complete details, but as so often happens, the stillman is obliged to put things in his picture which have nothing to do with the important part of the picture that he is trying to put over. In other words, if the stillman could report or suggest the main feature of interest on his negative, and have that enlarged to whatever the requirements are, I am sure that at least half of the thousands of negatives which are wasted could be saved, and many interesting angles and suggestions which in the past have been neglected could be brought out that would improve not only the finished product credited to the stillmen, but also the quality of the advertising and publicity emanating from the studios.

Most of the well-known photographers who shoot for the slick magazines such as *Life*, *Vogue*, etc., turn in only what they think is the best out of all their shots. They may make a great number of shots of the same subject, but submit only a selected few.

Another suggestion is that photographers working in the studios be brought

in closer contact with the representatives of the magazines and newspaper services, who in turn, should give them advice and even specific ideas on what the newspapers and magazines are demanding at the present time. This will not only save time and money, but also many wasted shots.

In the Hollywood studios we have men who are called upon to work not only on pictures that have action but also pictures that have very little photographic action—the more or less dialogue picture. Many of these have powerful entertainment values of the screen, but to cover them with still pictures that will tell a story much more thought and skill is required than most publicity executives believe is necessary. This is another reason why still photography should be given as much cooperation as possible in the way of having something to say in the selection of their work.

Our stillmen in the studios at the present time are men who have been doing this kind of work for years. They know a story when they see one and they can operate any type of camera if given the same opportunity that imported experts would be given. In the final analysis operating a camera is mechanical. It is the amount of intelligence and experience of the person behind the camera that results in pictures that will either tell the story or fail to tell the story. That applies to the use of cameras, whether they are candid cameras, action cameras, or 8 by 10 still cameras.

The year just ended was the most picture-conscious in history and 1938 bids fair to set a new record. I am sure that if studio stillmen are given more cooperation from all quarters during the coming year, that much money can be saved and superior quality pictures will result. Let's get behind the still photographer and give him a wider range of opportunity to improve his work. To that end the pages of *International Photographer* are open for any constructive comments, suggestions or discussions.

HERBERT ALLER

Miniature Pointers

Some Do's and Don'ts by a Local 659 veteran of pioneer days of still photography with 35mm. negative.

Like many thousands of others perhaps you have recently become interested in miniature photography or possibly found a new miniature camera in that Christmas stocking. To you then, this article is addressed. It is solely for the purpose of stressing or clarifying a few points so essential and yet so often overlooked—in this medium of photography.



RURAL CHARM is reflected in this excellent still of Edith Fellowes and Leo Carrillo shot during location scenes for the current Columbia pictures, "Little Miss Roughneck." The still is one of the series shot for the picture by Earl Crowley, member of Local 659.

First of all, the miniature camera has unfortunately been given the nick-name of "candid camera." That is because it does this difficult type of photography well. But because you have a candid camera, do not believe that that is the limits of its capabilities. Don't rush out and make candid photographs of all of your friends because it is surprising what this can do to friendship. A photographic faux pas on your part—and there ends a life time friendship. You will soon learn what even your best friends will tell you—where to go to make snap shots! Moreover, most candid pictures are merely the bad taste in photography.

If we had a book of rules for miniature photography rule one would surely be, **HOLD THE CAMERA STILL!** Most people get buck fever every time they shoot their camera and wiggle it all over the place. You have to aim and shoot that little camera as carefully as you would a revolver; just squeeze the trigger, so to speak. After a little brushing up on the fine points of fancy camera shooting you will probably be able to draw a camera and flick off an exposure quicker than Wild Bill Hickok could ever make the Indians bite the dust.

However, in all seriousness, holding the miniature camera still is one of the essential things in miniature photography that cannot be stressed too strongly. It is not hard to do. It only takes a little practice. I find it very easy to hold my Leica still for an exposure of 1/5th of a second and under conditions demanding one second exposure I have been

able to make passable pictures on an average of about one out of four exposures. Naturally your subject must also remain still for this length of time.

In order to facilitate the holding of the camera still it is a good plan to hold your breath a few seconds before and during the exposure. However if you anticipate making pictures at slow shutter speeds, and you should if your shutter is capable of it, try to plan your camera setups where you can brace yourself against a wall, table, or chair. With modern high speed panchromatic emulsions, especially the new Agfa Supreme and Ultra-Speed, it is easily possible to make all kinds of pictures within the home and elsewhere at night

using nothing more than the normal room lighting. Your exposures will run from about 1/20th to 1 second in duration, depending upon the speed of your lens and the amount of light upon your subject. As these exposures can be made with the carefully hand-held camera, much naturalness will result from the flexibility of your compositions.

One problem in holding the camera still over which we have no control, is heart action. The beating of the heart under strain of excitement sometimes makes it difficult to hold the camera still especially during the longer exposures. Of course one cannot stop his heart from beating but with a little concentration and by bracing himself much of

this trouble can be overcome. I sometimes use a device for slow exposures called a Beltipod. It is a rod with a tilting tripod head attached to it. It fits over the belt or coat button and is extremely useful as an aid in making slow hand-held exposures.

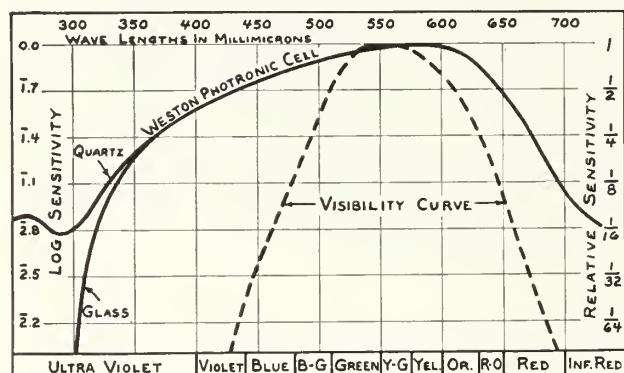
Just why it is so important to hold the camera still in miniature photography can be readily understood when one stops to consider that practically all miniature negatives are enlarged at least 3 diameters (9 times their actual size) for post card size pictures, and a great deal more for larger pictures. Of course any blur of definition in the negative traceable to camera movement will be greatly noticeable in the resultant enlarge-

The CINEMATOGRAPHER'S BOOK of TABLES

By Fred Westerberg

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SPECTRAL SENSITIVITY—WESTON CELL



RELATIVE SPECTRAL SENSITIVITY OF PHOTRONIC CELL USED IN WESTON EXPOSURE METERS

Wave Length In Milli-microns	Relative Sensitivity with Glass Window	Wave Length In Milli-microns	Relative Sensitivity with Glass Window	Wave Length In Milli-microns	Relative Sensitivity with Glass Window
300	.010	450	.584	600	.975
310	.035	460	.625	610	.932
320	.068	470	.663	620	.850
330	.110	480	.701	630	.732
340	.149	490	.740	640	.610
350	.186	500	.776	650	.490
360	.223	510	.823	660	.380
370	.261	520	.850	670	.280
380	.300	530	.887	680	.200
390	.345	540	.922	690	.154
400	.385	550	.952	700	.110
410	.426	560	.975	710	.088
420	.465	570	.995	720	.075
430	.504	580	1.000	730	.066
440	.544	590	.991	740	.060

Data by Weston Electrical Instrument Corporation.

CAMERA CRANES

STATISTICAL DATA ON CAMERA CRANES USED IN THE HOLLYWOOD MOTION PICTURE INDUSTRY

Studio or Rental Service	Weight In Pounds	Max. Height of Lens	CARRIAGE Dimensions		Height of Center Post	Length Crane Arm from Center Post
			Width	Length		
Fox	9,000	21' 4"	5' 7"	13'	8' 4"	19' 4"
	5,000	15'	5' 7"	9' 10"	6' 2"	13' 3"
Gen. Service	10,000	23' 4"	8' 6"	20'	10' 6"	21'
Kruse Rental	5,000	14' 3"	4' 10"	7'	7' 6"	11' 6"
M.G.M.	10,000	18' 6"	6' 2"	15' 10"	8' 6"	22'
	7,500	16' 6"	5' 9"	13'	7' 7"	14'
Paramount *	6,900	21'	4' 9"	10' 2"	7' 6"	21' 6"
	7,600	21'	5' 9"	11'	8' 9"	21' 6"
	2,000	9' 6"	4'	5'	5'	8' 10"
R.K.O. *	7,000	20' 6"	5' 8"	10' 6"	9' 4"	21' 6"
	2,500	11' 6"	5' 4"	8'	5' 6"	10' 6"
Roach	7,000	17' 6"	5' 7"	14'	7' 10"	14' 8"
United Artists*	8,000	20'	6' 6"	32'	10'	22' 6"
	6,500	13' 6"	5' 8"	27' 3"	8'	13' 6"
Universal*	8,000	42'	8'	23' 8"	15' 6"	28'
Warner	7,250	21' 7"	5' 4"	15' 4"	9' 2"	21' 6"

*Denotes solid tires. All others have pneumatic tires.
Heights relative to floor level.
Fox No. 1 and General Service cranes have extensions.
Data compiled by Roy Overbaugh and checked by International Photographer staff.
Data courtesy Selznick International.

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ments. In making an exposure push down on the shutter release until it is about to trip. Do this slowly. Then when your subject has that "it" expression give the release a slight squeeze and it will trip. You'll catch the expression that you desire because however fleeting it was you were all set for it and what's more it will be sharper on your negative because your camera was held still.

The next rule in miniature photography like all photography is to use the correct exposure. To do this use a printed exposure guide or an exposure meter. In any event make an honest effort to expose your negatives correctly and not depend upon the wide latitude of the emulsion to compensate for your errors.

It really ought to be a rule in miniature photography that you must develop all of your own negative rather than rushing down to the nearest drug store and asking them how soon they can get the prints back. It would certainly stop the making of a bunch of needless exposures and would result in more thought being given to better photography. When miniature photography was new, all of us practicing it had to develop and enlarge our own pictures, simply because no one else could do it for us successfully. I am proud to say

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Season's Greetings

Maurice Blache

that the results that we achieved proved beyond a doubt that the miniature camera had a very definite and useful place in photography. Besides if you really are interested in miniature photography you might as well have all of the fun. Developing a roll of miniature negatives is no trick at all and you can do it with as dependable results as you can get from any photo finisher.

To develop a roll of film you do not need a dark room. All you need is a developing tank, thermometer, graduate, developer, hypo, and the use of the kitchen sink for a few minutes. Naturally you will have to load your film in the developing tank in the dark (a few tanks can be loaded in daylight). Once the film is loaded in the tank all other developing operations are carried on in the light. The developing time of your negatives has all been figured out for you. So many minutes at so many degrees and it is all over. Just like baking a cake.

Perhaps you have been confused by all of this talk about fine grain. At the present time, forget about it. Of course the finer the grain is in your negatives, the sharper and better will be the definition of your negatives. However for all normal purposes and for the full enjoyment of your camera you need not worry about grain. I would like to suggest that at the start you choose a simple ready prepared developer like D76 or Rytol. They are easy to mix, keep well, give negatives of excellent gradation, and get the utmost out of every expos-

ure. Most fine grain developers while they give fine grain are very lacking in other respects. Let me repeat again, for the full enjoyment of your camera you need not worry about grain. You can go into that after you have absorbed the fundamentals.

Probably the majority of your prints will not be enlarged more than post card size and with only an enlargement up to 11 x 14 inches for the best ones. This should be well within the grain size of your negatives. Remember that most all salon prints are made upon the more beautiful matt surfaces of paper and not upon one of a glossy surface. Let those whose special work requires extremely large prints or a high degree of definition on glossy paper, worry about fine grain. Let's you and I have fun just making pictures.

As you possess the most versatile camera there is, you should not want for subject matter. You can make portraits, action pictures, landscapes, panoramas, stereoscopic pictures, copies, photomicrography, photomurals, astronomical pictures, etc. and etc. And when you finish doing them in black and white you can start right over and do them in beautiful color. If you've never seen any miniature photographs projected in color, you've got a treat in store for you. After all there are not so many DONT'S in miniature photography, but there are a lot of DO'S—and color is one of them.

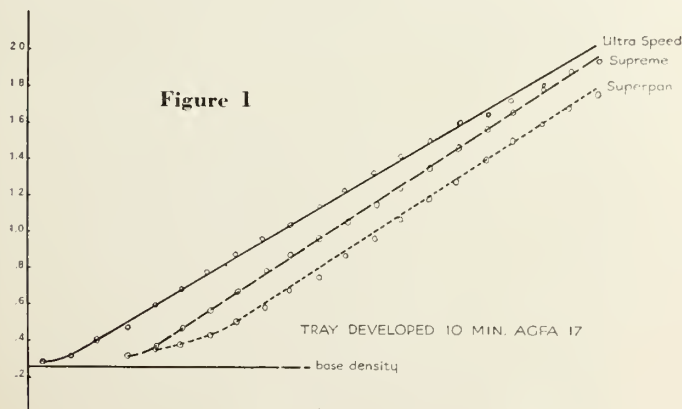
CLARENCE W. D. SLIFER, 659, IATSE.

Super Fast New Agfa Films

Leahy of Hollywood Charney organization reports technical highlights and benefits of much-discussed new films.

In the following article the two new Agfa 35 mm. negative products, Supreme and Ultra Speed Pan, are described technically and an outline given as to the practical advantages derived from their use in motion picture

production. As is already well-known, both types are the result of research on the part of Agfa Ansco engineers in Binghamton, New York, and are designed to increase photographic latitude without impairing the characteris-



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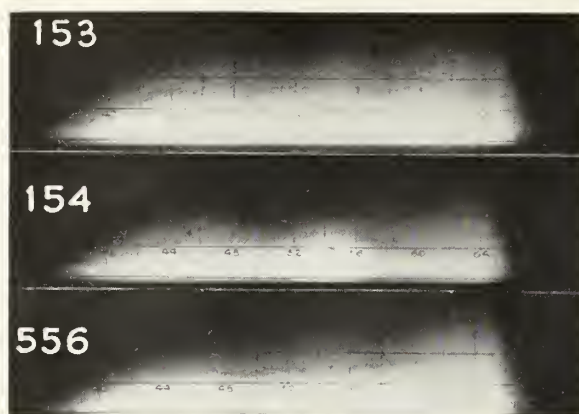


Figure 2

Supreme

Superpan

Ultra Speed Pan

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HOLLYWOOD'S leading miniature camera store, where large cameras and photo supplies also are sold.

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tics essential to high standard quality.

Supreme Type 153 35 mm. negative was brought forth in answer to the general demand for a production negative of higher speed and greater consequent latitude.

In producing this film type Agfa Ansco has successfully nullified the long accepted photographic axiom that grain size increases in ratio with high speed. The grain size of Supreme negative is definitely finer than previous super-sensitive panchromatic emulsion types.

In point of speed this type is twice as fast as Superpan negative and this increase was not obtained by any altera-

tion in the color sensitivity of the material.

The comparable gradation of Supreme with Superpan negative is revealed by an examination of Figure 1, which also shows the improved toe section, assuring less distortion of fine shadow detail. This comparison, as well as the gamma data shown accompanying Figure 1, was obtained by tray development of sensitometric strips in the Agfa Borax Developer No. 17.

The color sensitivity of Agfa Supreme is practically identical with that of Superpan negative and the Supreme can, therefore, be used with the same illumination and makeup conditions

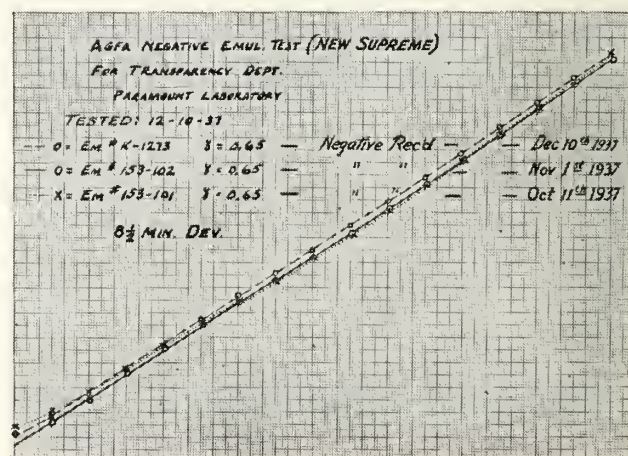
DEVELOPING TIME IN AGFA 17 DEVELOPER

	4	7	10	15 mins.
Supreme	0.39	0.59	0.77	1.05
Superpan	0.30	0.56	0.74	0.98

AGFA BORAX DEVELOPER NUMBER 17

Water to make	1.0 liter	32.0 ounces
Agfa Metol	1.5 grams	22.0 grains
Sodium sulphite, anhydrous	80.0 grams	2.0 ozs., 300 grains
Hydroquinon	3.0 grams	45.0 grains
Borax	3.0 grams	45.0 grains
Potassium bromide	0.5 grams	7.5 grains

Figure 3



Great fun...

THESE INDOOR MOVIES



INDOOR movies are easy to make nowadays—regardless of your camera's lens speed. Film is faster. Lights are brighter.

Use whatever Ciné-Kodak Film you wish. Black-and-white or full-color Kodachrome, 8 mm. or 16 mm. There's an exposure guide for each attached to Kodaflector—Eastman's \$5 twin-reflector lighting outfit. The guides tell you what aperture to use for various distances of lights from subjects. Decide

upon the most convenient distance, set the lens at the specified "stop"—and shoot.

Indoor movies are as simple as that, when you use the right lights and film. The right light, of course, is Kodaflector—the most efficient lighting outfit devised for use with inexpensive Photoflood lamps. The right film is Ciné-Kodak Film. Make your choice from among the four types shown below. Eastman Kodak Company, Rochester, N. Y.

• Ciné-Kodak Eight "Pan" Film, \$2.25 per roll. Ciné-Kodak Eight Kodachrome Type A, \$3.75 per roll. Ciné-Kodak Super-Sensitive "Pan" (16 mm.)—50-foot rolls, \$4; 50-foot magazines, \$4.25; 100-foot rolls, \$7.50. Ciné-Kodak Kodachrome Type A (16 mm.)—50-foot rolls, \$4.75; 50-foot magazines, \$5; 100-foot rolls, \$9. All prices include processing.



AGFA ANNOUNCES—

1 Agfa's new Supreme Negative is *twice as fast as Superpan!* And—at the same time—the grain size, color bal-

ance and gradation of this supersensitive panchromatic film are *better than Superpan!*

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BUT IMPROVED!**

BUT—in Agfa's new Supreme Negative these important features have not only been retained . . . they have been substantially IMPROVED . . . especially the *gradation* and *fineness of grain!*

The amazing speed of the new Supreme Negative permits stopping down to obtain more focal depth, thus extending the scope of background transparency photography, and of photographing medium close-ups where it becomes desirable to keep the foreground action and background action respectively in focus.

This new film is replacing Superpan. Samples of Supreme are now available. Get *yours* at once . . . and see for yourself what an ideal negative it is!



AGFA SUPREME NEGATIVE Supersensitive Panchromatic

TWO GREAT NEW 35mm. FILMS!

2 Agfa's new Ultra-Speed Panchromatic Negative is *three times as fast as Superpan!* This degree of speed increase,

heretofore inconceivable, makes Ultra-Speed the *fastest* film ever offered.

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THE CAMERAMEN

ULTRA-SPEED, originally designed to answer the requirements of newsreel photography, won instant approval in New York, and is eagerly sought for all types of news-recording.

OFFERS MANY POSSIBILITIES

Its phenomenal speed—3 times that of any negative previously available—finds many fields of applications in the motion picture industry. It is being widely used in all sorts of

emergencies when the greatest possible speed is desired.

BOTH AVAILABLE NOW!

Both of these great new Agfa Films—Supreme and Ultra-Speed . . . are available *now* for immediate delivery in quantity. Distributor is C. King Charney, Inc., 6424 Santa Monica Blvd., Hollywood and 245 W. 55th Street, New York.

Supreme and Ultra-Speed are **made by Agfa Ansco Corporation in Binghamton, New York.**

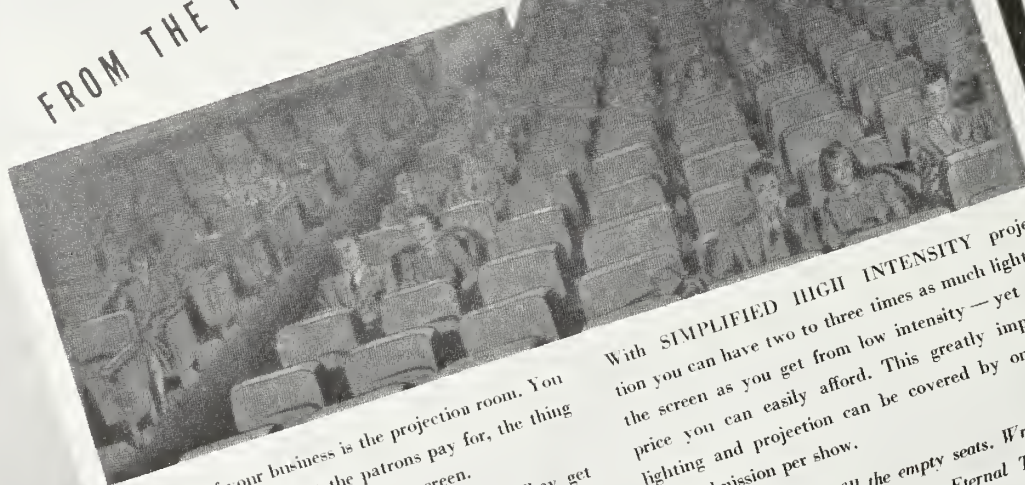
**AGFA ULTRA-SPEED
PANCHROMATIC NEGATIVE**



ONLY THE FILLED SEATS DETERMINE WHAT THE PICTURE WILL GROSS

By encouraging theaters to show the product of the studio at its best, it is hoped to contribute to the general progress of the Motion Picture Industry. The reproduction below shows the most recent advertisement of the series now appearing monthly in leading exhibitors' journals.—NATIONAL CARBON COMPANY, INC.

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that prevail with the use of present supersensitive panchromatic negative emulsions.

Figure 2 shows in two top strips the characteristic wedge spectogram of this film compared to Superpan negative.

No special precautions are necessary in the processing of this film type either in dark room illumination or in the developing and fixing process. Drying characteristics are the same as Superpan, and keeping quality, without the use of refrigeration or any other precaution necessary for hyper-sensitized products, is also assured to be equally as good as ordinary super-sensitive panchromatic emulsions.

Figure 3 represents a record kept at one of the major studios covering three shipments of Supreme negative received over a period of two months. It will be noted that the rolls tested were of three separate emulsion numbers and that the differences made evident on the graph are entirely negligible.

Figure 4 shows the multiplying filter factors of Wratten filters generally used for the two new film types.

The practical application of Agfa's Supreme for both straight production and process projection work has revealed many desirable qualities. It has been found, under ordinary set lighting conditions prevalent today, that it will deliver at F:4 a negative with equal printing density to that obtained with current negative materials at F:2.3, plus the definition from the smaller opening and the fine grain quality which is inherent to the material. Long shots with foreground action and medium shots in which awkward grouping of characters is necessary, and which have, heretofore, been a focus stumbling block to cinematographers, are definite-

Figure 5—DEVELOPING TIME IN AGFA B-17 DEVELOPER

	8.5	12.0	18.0 mins
Ultra Speed Pan	0.6	0.7	0.8
Superpan Negative	0.6	0.72	0.84

ly improved. Carrying backwall definition along with standard line lighting has resulted in a marked improvement in the roundness of characters.

In many instances where circumstances requires a reduction in light volume or a doubt exists whether sufficient light is available for large areas, Supreme negative has been found to be particularly efficient. It is a proven fact that a reduction of at least 40 per cent in illumination is possible with the use of this film, but a canvass of expressions from prominent cinematographers indicates a marked tendency toward a combination of a moderate reduction of light, coupled with openings of around F:3.5.

Used as material for montages and similar work which must later be duplicated, Supreme has been found to carry through to the composite product a far better definition and grain size than has been possible in the past. This is also true of miniature and glass shots where the value of an emulsion of high speed is self-evident when cameramen work above normal camera speeds.

The ever-present problems confronting the successful use of process projection shots have been materially reduced by the use of this film type. When used for the plate superior definition is obtained by smaller openings which, coupled with the fine grain quality, assists in securing a realistic effect. When the composite shot is made the combination of this plate, together with the foreground action, where again it is possible to stop down, pro-

duces a finished product which is a marked improvement over previous methods for this type of work.

Ultra Speed Pan Type 556 35 mm. Negative was designed as a special product for use in adverse light conditions and other circumstances where extremely high speed is essential.

The speed of Ultra Speed Pan is from three to four times faster than that of Superpan. This remarkable increase has been attained by only a slight alteration in color sensitivity as can be seen by an examination of the wedge spectogram shown in bottom strip of Figure 2.

The gradation of this film type is slightly flatter than either Superpan or Supreme. Sensitometric comparisons between Ultra Speed Pan, Supreme and Superpan can be seen in Figure 1 and can also be obtained from the following time gamma data which was secured by tray development of sensitometric strips in Agfa Borax Developer No. 17.

Filter factors of commonly used Wratten filters can be seen in Figure 4, in which the multiplying factors are given for Ultra Speed Pan, Supreme and Superpan.

Processing requirements are standard and any commonly used motion picture developer will give good results. No special precautions are necessary for storage and the keeping qualities of this high speed film is assured to equal that of ordinary super-sensitive panchromatic emulsions.

The grain size of this type compared to Superpan has been found to be slightly coarser, but in view of the special uses to which the film is applied it has not been found to be objectionable.

The general uses for which Ultra Speed Pan negative was designed are newsreel work, street and store night scenes made with natural illumination and all difficult day interiors where insufficient light is available.

In motion picture work this film has been found to be especially valuable for background plates of night street scenes in which intimate detail has heretofore been difficult to secure.

Experience has also shown that with the use of a very small amount of booster light, scenes employing characters can be photographed successfully on any well illuminated street.

The two new 35 mm. production negative types described above constitute a major step forward in the technical progress of the motion picture industry and it is with considerable pride on the part of the Agfa Ansco Corporation that they are announced.

WILSON LEAHY.

Figure 4—EXPOSURE MULTIPLYING FACTORS FOR WRATTEN FILTERS IN NORMAL DAYLIGHT

Filter Used	Ultra Speed	Superpan	Supreme
Aero No. 1	1.5	1.5	1.5
Aero No. 2	2.0	2.0	2.0
3N5	4.0	4.0	4.0
5N5	6.0	5.0	6.0
K-1	1.8	1.6	1.8
K-1½	2.0	1.8	2.0
K-2	2.0	1.9	2.0
Minus Blue	2.5	2.5	2.5
G	2.5	3.0	3.0
23-A	3.5	4.0	4.0
25-A	5.0	5.5	6.0
B	9.0	7.0	9.0
C	10.0	7.0	8.0
C-5	6.0	6.0	5.5
F	7.0	7.0	8.0
N.D. .25	1.8	1.8	1.8
N.D. .50	3.1	3.1	3.1
N.D. .75	5.6	5.6	5.6
N.D. 1.00	10.0	10.0	10.0
72	20.0	20.0	30.0

BIG PICTURES: "A

Latest Samuel Goldwyn hit picture was produced by George Haight and directed by Archie Mayo, from a story by N. A. Poggson, with screen play by Robert E. Sherwood. Art direction was by Richard Day and musical direction



The story of the great traveler-adventurer, Marco Polo (Gary Cooper) (1), who opened the first trade routes between Europe and Asia, takes place during the colorful reign of Kublai Khan, greatest of all Chinese Emperors. It opens when Marco, youngest of the Polo Brothers, Italian merchants and importers, is sent (2) by his father (Henry Kolker) from Venice to China.

After a long and arduous journey (3) Marco Polo and his servant, Binguccio (Ernest Truex), reach Peking. Marco carries the exhausted servant into the city (4) on his back. He amuses and impresses (5) the Great Khan (George Barbier) and at the same time falls in love (6) with the Princess Kuchichin (Sigrid Gurie) and although she is betrothed to the King of Persia, romance quickly develops between them.



However, a greater obstacle to Marco's courtship is the hatred of the cruel Saracen, Ahmed (Basil Rathbone), who also desires the Princess. On an apparently innocent journey into the interior, Marco is attacked by Ahmed's soldiers and narrowly escapes death—only to be captured (7) by Lord Kaidu, (Alan Hale) a general at war with the Khan.

Marco's personality impresses Kaidu, but when Nazama, his wife (Binnie Barnes), attempts to vamp the young Italian (8), Kaidu, wishing to be less annoyed by his jealous wife, promises to keep Marco alive as long as he amuses her. As a precautionary warning (9) Kaidu shows Marco the fate of spies. Marco saves Kaidu from an attempt on his life (10) and is rewarded by being granted considerable freedom, although still a prisoner.

He wanders curiously into the laboratory (11) of the wizard Chen Tau, who has invented an explosive powder, fine for making



entures of Marco Polo"

by Alfred Newman, with special music by Hugo Friedhofer. Cinematographer was Rudolph Mate; film editor, Fred Allen; sound recorder, Oscar Lagerstrom. Omar Kiam designed the costumes.



fire-crackers. Also, (12) Chen demonstrates with chop-sticks how to eat Spaghet, later to become the Italian national dish. Chen and Marco become friends and so the latter may travel about more freely Chen (13) disguises him as a coolie.

Back in Pekin, Kublai Khen, trusting Ahmed, leads his army (15) against the Japanese leaving Ahmed in full control. Knowing that the Khan and his army will be destroyed by a typhoon on the China Seas, Ahmed prepares to marry the Princess and declare himself Emperor.

Marco pleads with Kaidu to help him save the Princess from Ahmed. Kaidu is reluctant until Marco saves his life from assassination (17) by one of Ahmed's spies. In appreciation, Kaidu rallies his army to march to Pekin.

The whole army arrives in Pekin but is unable to storm the gates which are heavily fortified. Inside the Palace the Princess (16) is preparing to kill herself rather than submit to a wedding with Ahmed. Disguised as a slave, Marco gets to the Princess and convinces her that if she can delay the marriage ceremony long enough, Kaidu's army will attack and deal with Ahmed.

But Ahmed snares the army within the city walls and traps it between two closed gates until it is only a question of time before Ahmed's hordes will wipe out Kaidu's army.

Marco, now suspected by Kaidu, succeeds in blowing up the Palace Gates with gunpowder, which up to now, the Chinese had used only for toy firecrackers, terrorizing the populace (20). After a tremendous battle within the Palace, Marco rescues the Princess and Ahmed is killed (19).

Marco succeeds in cementing peace between Kaidu and the Khan, gets his "trade agreements," and embarks upon a long voyage with the Princess.



PATENTS

Last month the following patents of interest to readers of International Photographer were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,098,215—FILM DRIVING APPARATUS. *William A. Black*, Montclair, N. J., assignor to United Research Corp., Burbank, Calif., a corporation of Delaware. Application July 14, 1936, Serial No. 90,559. 8 Claims. (Cl. 271-2.3)

A system for the continuous and uniform advancement of a film past a translation point having a disconnectable flywheel.

No. 2,098,367—MOVING PICTURE FILM PRINTING MACHINE. *Rensen V. Wood*, Rochester, N. Y., assignor, by direct and mesne assignments, to Radio Corp. of America, New York, N. Y., a corporation of Delaware. Application June 8, 1931, Serial No. 542,867. Renewed Sept. 28, 1934. 2 Claims (Cl. 95-75)

A printer in which the negatives and positives mesh with the same sprocket and pass over a control drum while held in frictional contact.

No. 2,098,441—PHOTOGRAPHIC PROCESS WITH EXPOSURE DIMINUTION. *Leonard T. Troland*, deceased, late of Cambridge, Mass., by the Cambridge Trust Co., executor, Cambridge, Mass., assignor to Technicolor Motion Picture Corporation, Hollywood, Calif., a corporation of Maine. Application August 10, 1933, Serial No. 684,546. 3 Claims. (Cl. 95-5.6)

A method of controlling the gradation of a photographic gelatin relief which includes uniformly exposing the latent image to light adapted to photographically diminish the image.

No. 2,098,442—PHOTOGRAPHIC PROCESS WITH EXPOSURE DIMINUTION. *Leonard T. Troland*, deceased, late of Cambridge, Mass., by the Cambridge Trust Co., executor, Cambridge, Mass., assignor to Technicolor Motion Picture Corp., Hollywood, Calif., a corporation of Maine. Original application August 10, 1933, Serial No. 684,546. Divided and this application November 16, 1935, Serial No. 50,161. 6 Claims. (Cl. 95-2)

A method of combining photographic records utilizing the principles of the above patent.

No. 2,098,602—COLOR PHOTOGRAPHY. *Stanley Dennis Threadgold*, Ilford, England, assignor, by mesne assignments to Dufay Chromex Ltd., Aldwych, London, England. Application Oct. 19, 1935, Serial No. 45,823. In Great Britain Nov. 3, 1934. 4 Claims. (Cl. 95-75)

Apparatus for the contact printing of multi-color photographic master originals of regular pattern multi-color screen type on to film of the same type.

No. 2,098,699 and Appln. 4/30/35, Ser. No. 19,034. 5 Claims. (Cl. 88-16.2). No. 2,098,700—COMBINED SOUND AND PICTURE APPARATUS—Appln. 7/26/35, Ser. No. 33,257. 17 Claims. (Cl. 271-2.3). *Cecil N. Batsel*, Haddonfield, N. J., assignor to Radio Corp. of America, a corporation of Delaware.

Both patents cover apparatus for insuring uniform travel of film past the sound translating station.

No. 2,098,767—DOUBLE SIMULTANEOUS MOTION PICTURE APPARATUS. *Richard Thomas*, Los Angeles, Calif., assignor of one-half to Williams Jennings Bryan, Jr., Los Angeles,

Calif. Application March 18, 1935, Serial No. 11,701. 5 Claims. (Cl. 88-16.6)

A lens and septum assembly for a light-dividing color camera.

No. 2,098,891—PHOTOGRAPHIC MATERIAL. *Wilhelm Schneider*, Dessau in Anhalt, and Gustav Wilmanns, Wolfen Kreis Bitterfeld, Germany, assignors to Agfa Anso Corp., Binghamton, N. Y., a corporation of New York. Application Nov. 16, 1934, Serial No. 753,390. In Germany Nov. 18, 1933. 4 Claims. (Cl. 95-8)

An anti-halation film.

No. 2,099,159—DEVELOPING APPARATUS. *Ferdinand Busse*, Munich, Germany, assignor to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt-on-the-Main, Germany. Application July 9, 1936, Serial No. 89,718. In Germany July 12, 1935. 7 Claims. (Cl. 95-90.5)

A portable daylight developing machine.

No. 2,099,245—MOTION PICTURE FILM TREATING APPARATUS. *Frederick B. Thompson*, Hollywood, Calif. Application July 21, 1936, Serial No. 91,710. 16 Claims. (Cl. 271-2.3)

A vertical type motion picture developing machine in which the film pursues a tortuous path.

No. 2,099,297—PHOTOGRAPHIC MATERIAL AND PROCESS. *Louis Etienne Clément*, Meudon-Val-Fleury, Eastman Kodak Co., Jersey City, N. J., a corporation of N. J. No Drawing. Application June 23, 1936, Serial No. 86,775. In France June 24, 1935. 2 Claims. (Cl. 95-6)

A film for color photography carrying a color-forming substance in the emulsion.

No. 2,099,376—MOTION PICTURE AND SOUND REPRODUCING MACHINE. *Abraham Shapiro*, Chicago, Ill., assignor to Universal Stamping & Mfg. Co., Chicago, Ill., a corporation of Illinois. Application June 26, 1936, Serial No. 87,438. 6 Claims. (Cl. 179-100.3)

A sound projector with a novel compact assembly arrangement for its various parts.

No. 2,099,404—LIGHT SENSITIVE COLLOID LAYERS AND TANNED PICTURES THEREFROM. *Gustav Kögel*, Baden-Baden, and Rudolf Zahn, Wiesbaden, Germany, assignors to Kalle & Co., Aktiengesellschaft, Wiesbaden, Biebrich, Germany. No Drawing. Application Jan. 10, 1935, Serial No. 1,238. In Germany Jan. 19, 1934. 8 Claims. (Cl. 95-6)

A film in which the emulsion carries a substance the light decomposition products of which will tan the emulsion.

No. 2,099,865—SOUND PICTURE SYSTEM. *Edmund R. Morton*, New York, N. Y., assignor to Bell Telephone Laboratories, Inc., New York, N. Y., a corporation of New York. Application Oct. 12, 1934, Serial No. 748,028. 14 Claims. (Cl. 271-2.3)

A two-motor hook-up for securing uniform film speed in a sound apparatus.

No. 2,099,987—FILM DRIVING SYSTEM. *Sidney*

A. Murdock, Los Angeles, Calif., assignor by mesne assignments, to Robert Gumbiner, Los Angeles, Calif. Application Jan. 2, 1935, Serial No. 94. 9 Claims. (Cl. 271-2.3)

Another apparatus for securing uniform speed for the sound film.

No. 2,100,000—CINEMATOGRAPHIC CAMERA AND PROJECTOR. *Charles Edward Hillery-Collings*, Mitcham, England. Application Nov. 16, 1935, Serial No. 50,069. In Great Britain Nov. 16, 1934. 2 Claims. (Cl. 88-19.3)

A convertible camera-projector with a double shutter.

No. 2,100,006—PRINTING OR REPRODUCING COLOR PHOTOGRAPHS. *Geoffrey Bond Harrison* and *Stanley Dennis Threadgold*, Ilford, England, assignors, by mesne assignments, to Dufay-Chromex, Ltd., Aldwych, London, Eng. Application April 29, 1935, Serial No. 18,952. In Great Britain May 2, 1934. 5 Claims. (Cl. 95-75)

A method of printing screen-plate color photographs including the use of a plurality of differently colored light beams.

No. 2,100,134—APPARATUS FOR PROJECTING LENTICULAR FILM. *John Eggert*, Leipzig-Gohlis, and *Gerd Heymer*, Wolfen Kreis Bitterfeld, Germany, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt-on-the-Main, Germany. Application Nov. 24, 1934, Serial No. 754,656. In Germany Nov. 25, 1933. 2 Claims. (Cl. 88-16.4)

A projection apparatus for color film of the Keller-Dorian type.

No. 2,100,594—COLOR PHOTOGRAPHY. *Gerd Heymer*, Dessau-in-Anhalt, Germany, assignor to Agfa Anso Corp., Binghamton, N. Y., a corporation of New York. No drawing. Application Oct. 21, 1933, Serial No. 694,689. In Great Britain May 5, 1932. 6 Claims. (Cl. 95-88)

A solution for discharging dye in the presence of silver and dissolving a silver image.

No. 2,100,634—APPARATUS FOR PROJECTING PICTURES IN RELIEF. *Douglas Fredwill Winck Coffey*, New York, N. Y., assignor to Winnek Stereoscopic Processes, Inc., Wilmington, Del., a corporation of Delaware. Application Nov. 27, 1931, Serial No. 577,519. 2 Claims. (Cl. 88-24)

A composite screen for stereoscopic projection comprising a flat translucent screen, a lenticular resolving screen on one side thereof and a selective screen on the other side thereof.

No. 2,100,740—METHOD OF MAKING VARIABLE AREA SOUND FILM WITH LOW BACK-GROUND NOISE. *Rolf Görisch*, Berlin-Lichtenberg, Germany, assignor to Klangfilm G. m. b. H., Berlin, Germany, a corporation of Germany. No drawing. Application Feb. 6, 1935, Serial No. 5,259. In Germany May 8, 1934. 6 Claims. (Cl. 274-46)

Treating the developed sound track with a reducing agent.

LIGHTING-SETS

Nine Cameras Film Huge Set

Biggest night scene ever filmed is highlight of MGM's "Rosalie"; occupied 60 acres, used 1500 extras.

It took twenty-seven cameramen to catch the magnificence of the Romanza set, which was constructed for Metro-Goldwyn-Mayer's extravaganza, "Rosalie," currently starring Nelson Eddy and Eleanor Powell.

Largest set ever to be filmed entirely at night, and one of the biggest musical production numbers ever staged, it was constructed on sixty acres adjoining the main studio. Nine cameras were used to film each scene, with a crew

Stillmen Grimes and Carpenter, members of Local 659, caught these spectacular shots of the biggest musical set, which was photographed at night by nine cameras for MGM's "Rosalie" and is described in the accompanying story.



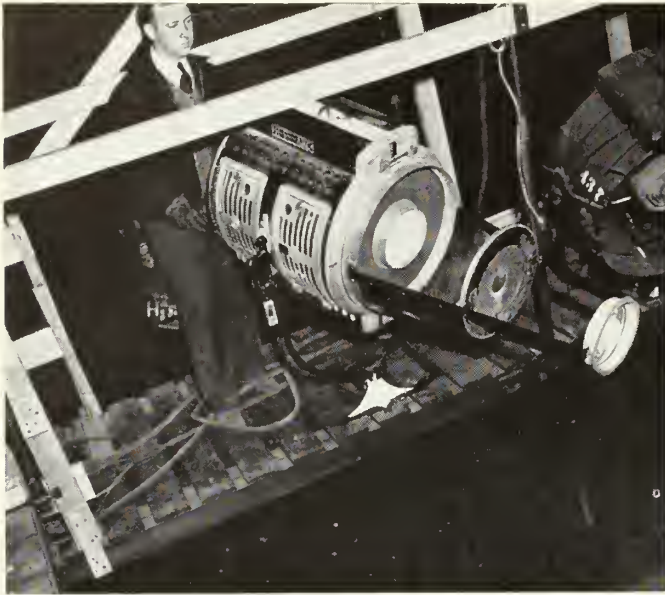
of three cameramen, two grips, three laborers and three special men attached to each camera.

One portion of the set was extended to the height of 150 feet, where one camera crew and lights were situated. Another extreme angle was accomplished by having another camera film the action of Eleanor Powell, Nelson

Eddy, Ilona Massey, Frank Morgan, Ray Bolger and Edna May Oliver with the camera on the floor.

A third camera was situated about 100 feet from the ground to take in the whirling action of the 300 gypsy and Tartar dancers who whirled giddily around 15,000 square feet of gaily painted cement.

Fifty acrobatic dancers, trained for the number by Mme. Albertina Rasch for more than two months, were captured during their exciting number, by camera number four, some 50 feet from the ground. On an extended platform, the same height from the ground on the opposite side of the colonnaded Plaza, which is in the shape of a horseshoe,



NOVEL LAMP SET UP SOLVES PROBLEM of throwing a spotlight against the background of white ice to follow Sonja Henie in her skating numbers. It was developed by Walter Strohm, chief engineer at 20th Century-Fox studios. The speed at which Sonja skates in her current production, "Happy Land-ing," requires that the light be projected from quite a distance to allow easy handling, while the ice background necessitates a high degree of intensity as well as clear outline. After Strohm

had worked out the problem and completed the designs, it was constructed on the lot, using a Mole Richardson Type 170 light with projector lens. One lens is fitted over the face of the arc light, with the other lens extended out by means of metal rods. Midway between the two lenses is an iris which regulates the diameter of the projected light. On one of the catwalks high above the stage, this new type of high power spotlight is shown being manipulated by Electrician Charles Wise, member of Local 37, IATSE.

with a Castle as a background, was camera number five.

Practically shooting outside the set were two additional cameras, only 25 feet from the cement floor, but in such a position that they could catch the entire action of the number. An eighth camera recorded the movements of the 1500 extras, garbed in the gay clothes of peasants as they joined the celebration.

Most unique of all was the ninth camera, which was personally supervised by Director W. S. Van Dyke and William Anthony McGuire, producer, with Oliver Marsh in active charge. Manned by more than fourscore men, this camera was attached to the end of a ninety-foot boom, which in turn was part of an eight-wheeled platform.

It never stopped moving, for as the boom swept up and down picking out a dancing principal here and there, the platform was moving along at breakneck speed.

The second cameraman, operating the camera, wore earphones and has a chest set in which to shout his directions to the men in charge of the "pushers."

So perfectly balanced was the 90-foot boom, by use of lead weights, that the operator on the base end of the boom was able to swing it about with one hand, thus making it possible to film effective angles of the spectacle scene with perfect smoothness.

Sets Authenticity

Selznick International set decorator keeps photographic file for protection on smallest details.

Being a set-decorator in a motion picture studio is one thing, but being a decorator at Selznick International is quite another. David O. Selznick gives his personal attention to every tiny detail, which to him is as important as the picture as a whole, and so when he asks "why?" and "how?" and "on what authority?" something on the set is being used, I usually run for a photographic file that I have kept for years and usually succeed in producing the proof.

Whenever a concrete idea is photographic I snap it with a Reflex Korelle that has an F:1.9 lens, using super speed film, and then file it away for future reference.

The set decorator differs from the modern version of interior decorator as we know them in our private homes in that he has to have a practical working knowledge of every country's people, the way they live, their costumes, customs, and habits. He has to know what flowers grow there and when—a thousand years ago and a thousand years from now; how the Iowa farmer's wife "sets" her Sunday table and how servants of the French Kings placed the silver and crystal at state banquets; gypsies' superstitions and the little

gadgets that they hang in their wagons when traveling—a million and one LITTLE things that tend to crowd your mind over a period of twenty years of studio detail in decoration.

I have in my files complete camera diaries of the three pictures that I have made for Mr. Selznick, "The Prisoner of Zenda," "Little Lord Fauntleroy," and "The Adventures of Tom Sawyer."

These diaries start with the location trips of the director and his assistants, include all possibilities as to where the settings might be built, run through the entire picture and cover each completed set and also many amusing side candid shots.

Just recently I made a trip into the interior of Old Mexico and added about 300 pictures to my collection. I photographed the interiors and exteriors of churches, homes, old carved stone facades, modern structures, markets, habits, religious ceremonies (I happened to be there during the Fiesta de los Muertos), the many types of thatched roofs, which were a total surprise to me, methods of "packing" their burros, fences, and any number of other shots that will come in handy at some future date.

Now all I have to do is to wait for Mr. Selznick to make a picture with a Mexican locale and I will amaze him with my superb knowledge of Mexico, and in case of any argument I will show him Mexico as I saw it through my camera.

CASEY ROBERTS.



Shots from Casey Roberts' photographic file, part of a set of 300 on Mexico. Top left, an old refectory table sixty feet long in carved stone, frescoes above being in terra-cotta reds, blacks and greys. Top right pictures the facade

of the old cathedral of Mexico City, showing earthquake cracks held together by white stones. Lower left, candy skulls used in ceremonies of "Fiesta de los Muertos;" and lower right, interior of the main cathedral of Puebla, photographed during Mass.

LABORATORY

Ousting Sludge by Filtration

Consolidated Film chemist tells successful method for extending useful life of film developing baths.

The useful life of a negative developing bath, especially one producing fine-grain by virtue of its low alkalinity, is considerably shortened by the accumulation of a colloidal silver suspension which adheres to the celluloid of film developed in the solution and is very difficult to remove. The sludge is

the result of the reducing action of the developing agents on a silver complex formed by the solvent action of high concentrations of sodium sulfite on the silver halide of sensitive photographic emulsions.

The silver sludge is composed of such small particles that the solution

cannot be clarified by ordinary filtration methods. Even filter paper such as is used in the chemical laboratory does not remove the suspended sludge. For this reason, filter installations of cloth bags, felt retainers, or similar materials which in the past have sometimes been applied to developing baths, are effective only as strainers in keeping the solution free of large foreign particles; they are completely ineffectual in removing sludge.

In seeking a method of obtaining perfectly clear solutions in the case of large quantities of developing baths such as are used in the film laboratory of Consolidated Film Industries, Inc. in Hollywood, various materials known as filter-aids were tried. Since the removal of fine suspended particles from liquids is a common industrial operation, a

Laboratory Executives!

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The new Allison-Bristol pH Recorder

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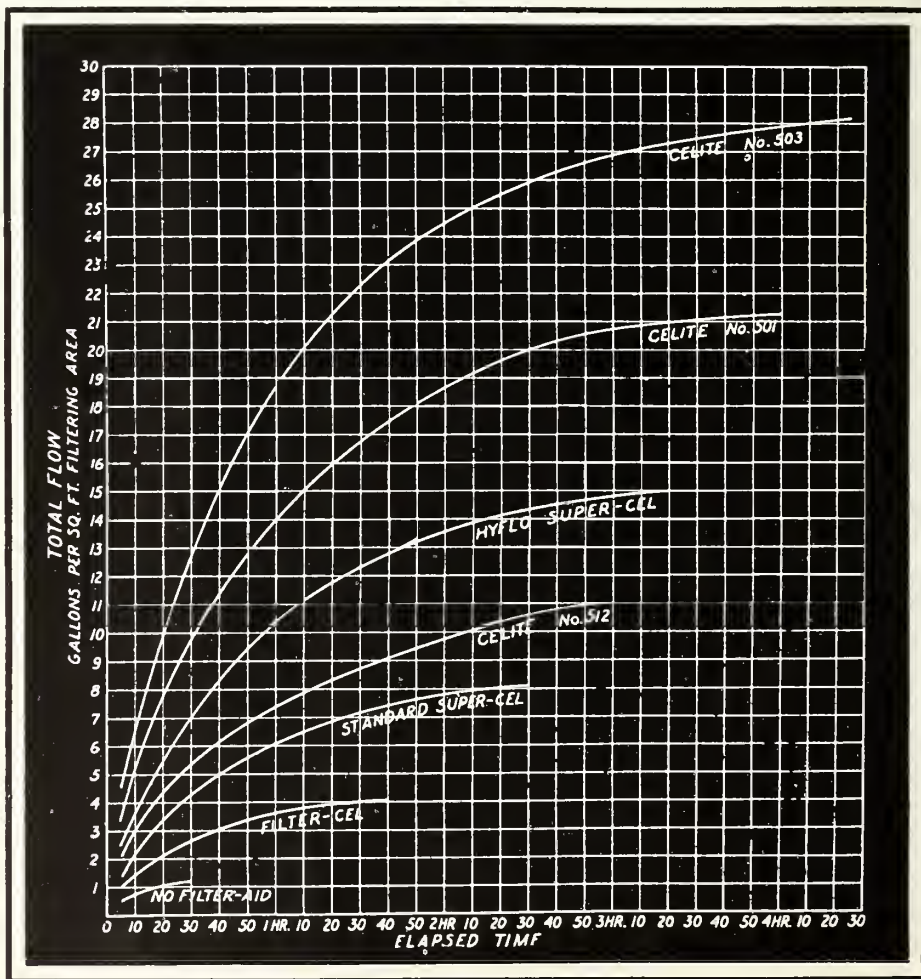
number of products, which have already found a wide application in industry for this purpose, were easily obtained. The special problem of photographic developers is that these solutions are more easily affected by clarifying media than the usual industrial product: activated carbon, for instance, had to be ruled out very early because it not only removed the colloidal silver, but absorbed most of the developing agents as well. Diatomaceous earth products of the Johns-Manville company seemed to offer the greatest promise, and further experiments on degree of clarification and flow-rates indicated that the grade known as Filter-Cel was the best suited for the problem at hand. This material is the same filter-aid that is used extensively for the clarification of alcoholic beverages, dry-cleaning solvents, and lacquers. Rigorous tests on developing baths before and after filtration with Filter-Cel showed that it was without effect on the photographic characteristics of the solution.

Selection of the best type of filter to use for developing baths was the harder problem. To meet the requirements, obviously, the filter should be constructed of non-corrosive materials, without effect on the solution, easily cleaned, and of sufficient capacity to provide a reasonable filtration rate. The familiar plate-and-frame type of filter was ruled

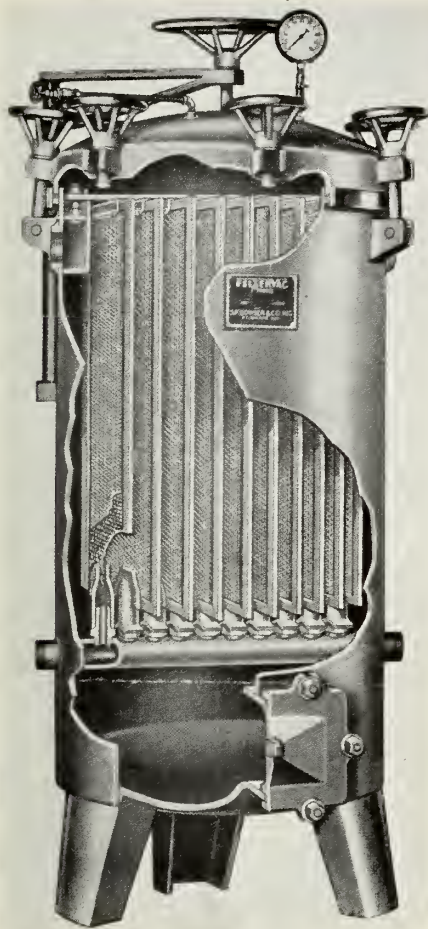
out because of the necessity of having it specially constructed of hard rubber, the requirement of high-pressure pumping equipment, and the excessive time and labor spent in cleaning it.

Inasmuch as the dry-cleaning and beverage industries were employing the same filter-aid that had proved effective when applied to developing baths, the kind of filtering equipment generally used in these industries was also considered. It was found that the leaf-type filters manufactured by S. F. Bowser & Co. presented the most attractive design. One of these filters with a capacity of 1000 gals. per hour was installed. The screens of the standard model were already of Monel Metal, so that only a few changes had to be made by the manufacturer to attain a filter that was completely corrosion resistant. The most important advantages that these filters offer are large screen surface in a comparatively small container, and extreme ease and rapidity of cleaning.

Installation of the filter was made in such a way as to permit continuous filtration even during periods when the bath is being used for developing film. This was accomplished by means of a separate line running from the machines into a slurry tank where Filter-Cel (about 1/4% by weight) is added and stirred. The suspension is forced from



Flow rates of diatomaceous earth products of Johns-Manville Co.



Bowser leaf-type filter.

this tank through the filter by a stainless steel centrifugal pump into the main circulation tank.

When the filter has been cleaned or is being first put into service, the effluent from the filter is directed back into the slurry tank until a clear filtrate begins to flow. This indicates that an adequate cake of the Filter-Cel has been deposited on the screens of the filter. The filtration is allowed to continue

until the pressure as indicated on a bourdon gauge reaches 45 lbs., at which point the rate of flow has been reduced to about one-quarter the rate at the beginning of the cycle. The filter pump is stopped, and the filter is cleaned, pre-coated, and put back into operation, the whole interruption consuming about fifteen minutes.

The initial installation on the picture negative bath having produced such satisfactory results, similar installations were made on the positive developing bath and the sound track developing baths. In the case of the positive bath, a suspended highly colored sludge is removed leaving a transparent yellowish solution.

Our experience shows that use of clarified developers has resulted in cleaner negatives and prints and has reduced the tendency of the baths to build up objectionable deposits of sludge in the developing machines.

SID SOLOW, Consolidated Film Industries

Modern Lab at WB

New \$500,000 lab setup at Burbank features every technical facility for film processing.

One of the largest and most modern film laboratories in the world will be in operation this month at Warners' Burbank studio, replacing the lab on their Sunset lot, which has been used for many years. The new plant will speed up handling of negatives for the 60 or more features made by Warners each year as well as all prints used on the West Coast. It is part of a general long range improvement and expansion program instituted several years ago at the Burbank studio.

The building was designed by Art Director and Architect Bert Teitlebaum, primarily for utilitarian purposes. It

is strictly modern in appearance, with pleasing masses and lines. Two stories and a basement are included but the structure is much higher than the average two-floored building because two "theaters" are located on the upper floor, while the ventilating and air-conditioning systems, film elevators and supply tanks are all enclosed within the structure.

Fred Gage, chief laboratory engineer for Warners, and Al Tondreau and Red Munson, his assistants, took an active part in planning the new building. The plumbing was under the supervision of Otto Erbes and the whole job, one of the most highly technical in the history of studio building, was in the hands of an outside contractor under the general supervision of Henry Fuhrman, head of maintenance and construction.

Engineers familiar with the problems of designing film laboratories know that three vital problems must be met in such a building. It must, above all else, be as nearly fireproof as modern construction methods can make it. It must be dustproof and it must be so designed that air conditions inside are stable, with temperature changes limited, the year around, to not more than one-tenth of one degree, since film curls when subjected to sudden temperature changes.

The building is of concrete and glass tile construction with walls impervious to outside temperature changes. It is of Class A fireproof construction. Only wood used is in the solution tanks of the developing room. Steel studding and metal lath were used in all partitions and all doors and window frames are of pressed steel.

All plumbing fixtures are of stainless steel with brass fittings to resist chemical action of acids used in processing. Floors are of tile or concrete covered with linoleum. All ornamental as well



Warners' new 24 unit film vault and at right modernistic shot of new \$500,000 lab.

as utilitarian iron work is chrome finished.

The building covers 19,000 square feet of ground and will house the technical research workers as well as the active laboratory crew of several hundred. Complete, it will represent a total investment of more than \$500,000.

To maintain the dustless interior so vital for film laboratory work, the air is washed three times before it is permitted to circulate through the building. First washing is through an oil soaked filter; second, through a blown glass filter; third, through a paper filter.

Fireproofing is made more complete by the installation of a sprinkler system with one sprinkler head for each 80 square feet of ceiling space. All electrical conduit is vapor proof and all lamps are the explosion proof type.

A silver reclaiming room, wherein discarded film is stripped of the valu-

able deposit, is another feature of the laboratory. Up to now the studio has sold its old film to reclaiming companies, receiving a share of the profit.

Upwards of a million feet of film, negative and positive, can be run through the plant each twenty-four hours, automatically developed, fixed, washed, dried and wound. There is enough equipment to take care of all contemplated increase in production for many years to come.

Film being developed or printed in the new plant is protected in every way possible. Should electrical power suddenly be shut off, the building has generators which cut in automatically and instantly. Everything is planned to make it impossible to ruin a valuable piece of film in the laboratory. The master prints of newly finished pictures often represent an investment of more than a million dollars and no studio can afford to take chances with them in the laboratory process.

SOUND

508 Pages on Sound

First tome to examine the sound field as reaching scientific status issued by Academy Council.

MOTION PICTURE SOUND ENGINEERING.
Published by the Research Council of The Academy of Motion Picture Arts and Sciences. (\$4).

The technique of recording and reproducing sound on film has a history remarkable mainly for its brevity. Due to intensive economic and creative showmanship pressure, developments and improvements in the field have come so rapidly—relatively speaking—that up to now it has hardly seemed worth while to take time out to assemble material

The LABORATORY BOOK of TABLES

By D. K. Allison

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ANALYSIS OF FIXING SOLUTION

Sample as delivered to Laboratory
Filter if turbid; decant if clear.

Take 10.00 ml. sample. Dilute with 25 ml. water, add 5 drops solution G titrate with 0.25 N iodine to first blue coloration. Record volume as "Volume A."

Volume A — Volume B
x
1.303 =
Grams NaHSO₃
per liter.

Take 10.00 ml. sample. Add 10 ml. 0.5 N Sr(NO₃)₂ solution. Filter, wash ppt. three times with 10 ml. portions of distilled water. Combine washings and filtrate.

Ppt.

Filtrate

Reject

Add 5 drops Solution G. Titrate with 0.25 N iodine solution to first blue coloration.

Record volume as "Volume B."

Volume B
x
6.25 =
grams Sodium Thiosulfate per liter.

Note: for rapid work the filtration may be dispensed with and the titration made quickly with stirring.

Treat two 100 ml. samples according to the C & R glass electrode technique.

Report as pH.
(Alternately determine pH colorimetrically using Bromocresol Green Photoelectric colorimeter recommended)

Electrolytic Method for Silver:

Place 50.0 ml. sample in electrolysis cell equipped with platinum cathode and stirring anode. Electrolyze 6 hours at 1.05 volts.

Wash cathode carefully in water and alcohol; dry.

Gain in weight of cathode

x
20.0 =
grams silver per liter.

Chemical Method for Silver:

Take 50.0 ml. sample, add 10 gms. Na₂SO₃ and 2 ml. Solution H. Add 2 gms. 30 mesh granulated zinc, boil 10 min.; filter.

Residue

Filtrate

Dissolve in 20 ml. Solution H and 20 ml. water. Add 10 drops Solution J and add N/10 NaOH to first brown coloration.

Add 5 drops Solution H and titrate with 0.10 N. KSCN to first pink color.

Volume KSCN
x
0.216 =
gms. silver per liter.

Photoelectric Method for Silver:

Treat sample as directed for the use of the Eastman Photoelectric Argentometer.

Report as gms. silver per liter.

Analysis for Hardener: When chrome alum is used as the hardening agent, the chrome alum content may be determined against chrome alum solution of known concentration, using the Duboscq Colorimeter taking care that the pH of sample and standard are within 0.1 pH unit.

Depth Standard

Depth sample
x
Concentration standard
=
gms. chrome alum per liter.

(Note: Potassium alum may be determined electrometrically.)

DIRECTIONS FOR THE PREPARATION OF SPECIAL SOLUTIONS AND REAGENTS FOR THE ANALYSIS OF FIXING SOLUTION

0.5 N Sr(NO₃)₂—53 gms. Sr(NO₃)₂ per liter.
0.25 N iodine solution—Dissolve 65 gms. KI in 200 ml. water; add 31.73 gms. I₂, make to 1 liter.
0.10 N KSCN—10 gms. KSCN per liter. Standardize against AgNO₃.
Solution G—6 gms. soluble starch triturated cold, made to 1 liter with boiling water, 10 gms. ZnSO₄ added.

Solution H—8N HNO₃.
Solution J—Cold saturated ferric ammonium sulphate to which enough nitric acid has been added to cause disappearance of brown coloration.
N/10 NaOH—4 gms. NaOH per liter.

for a book on the subject. Such a book would have been out of date in a matter of months. However, while no one would dare to intimate that progress and change have ceased, nevertheless, it is obvious that the time has come to present some of the fundamental qualitative and quantitative relationships which have been observed and measured during the last few years.

"Studio sound" has grown out of the "rule of thumb" stage and is starting to obey applications of underlying theory expressed in the language of science and engineering mathematics. Thus, the presentation of an Engineering Handbook on Studio Sound by the Academy Research Council represents an important milestone in the progress of the technique out of the stage of the "arts and crafts" into the field of Science and Engineering.

A tremendous amount of work by a large number of people has gone into the book and the result is not only complete, but also very useful.

The following subjects discussed deserve particular mention as many of them are new developments and as such are unfamiliar to the majority of sound men:

Class A, AB and B push-pull recording.

Squeeze and Split Squeeze recording. Bilateral and Duplex recording.

"Complementary Recording."

"Split Channel" noise reduction.

Volume range Compression.

Peak limiters.

Projection Threshold limiter.

Unidirectional Microphone.

Two way horn systems.

Regular, Hi-range and Lo-range prints.

Radial Impedance of Shields.

Dubbed reverberation.

New Condenser type dialogue mike.

Phase and delay distortion.

Ladder, Bridge Tee and Lattice pads.

Constant impedance equalizers.

Predistortion.

Constant impedance dividing networks.

Stabilized Feedback Amplifiers.

Linear Decibel Scale Level Indicator.

On a few minor points the book could stand some improvement but the reviewer is almost ashamed to mention these unimportant deficiencies in the face of the superlative chapters on filters, equalizers, noise reduction, light modulation, shielding, phase distortion and fundamental electrical theory. In all of these chapters material is presented which is largely available in no other book and I feel sure that communications engineers in the radio and telephone fields also will widely use this handbook for its practical presentation of wave filter and network theory.

The reviewer feels that the book, as a whole, is not as well edited as it might be and that the order of presen-

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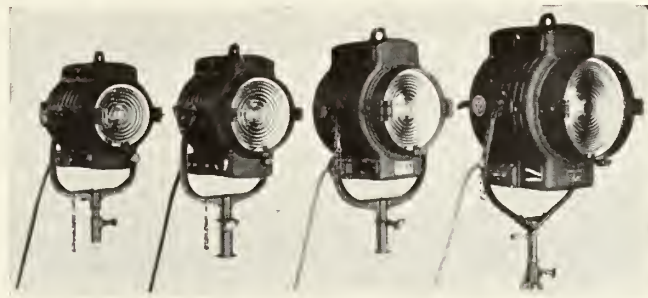
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The SOUNDMAN'S BOOK of TABLES

By J. N. A. Hawkins

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The Decibel Table

Decibels	$\frac{E_1}{E_2}$ or $\frac{I_1}{I_2}$	$\frac{P_1}{P_2}$	$\frac{P_2}{P_1}$	$\frac{E_2}{E_1}$ or $\frac{I_2}{I_1}$
0.0	1.000	1.000	1.000	1.000
.1	1.01	1.02	.977	.989
.2	1.02	1.05	.955	.977
.3	1.04	1.07	.933	.966
.4	1.05	1.10	.912	.955
.5	1.06	1.12	.891	.944
.6	1.07	1.15	.871	.933
.7	1.08	1.18	.851	.923
.8	1.10	1.20	.832	.912
.9	1.11	1.23	.813	.902
1.0	1.122	1.259	.7943	.8913
2.0	1.259	1.585	.6310	.7943
3.0	1.413	1.995	.5012	.7080
4.0	1.585	2.512	.3981	.6310
5.0	1.778	3.162	.3162	.5623
6.0	1.995	3.981	.2512	.5012
7.0	2.239	5.012	.1995	.4467
8.0	2.512	6.310	.1585	.3981
9.0	2.818	7.943	.1259	.3548
10.0	3.162	10.000	.1000	.3162
11.0	3.548	12.59	.07943	.2818
12.0	3.981	15.85	.06310	.2512
13.0	4.467	19.95	.05012	.2239
14.0	5.012	25.12	.03981	.1995
15.0	5.623	31.62	.03162	.1778
16.0	6.310	39.81	.02512	.1585
17.0	7.080	50.12	.01995	.1412
18.0	7.943	63.10	.01585	.1259
19.0	8.913	79.43	.01259	.1122
20.0	10.000	100.00	.01000	.1000

Decibels	$\frac{E_1}{E_2}$ or $\frac{I_1}{I_2}$	$\frac{P_1}{P_2}$	$\frac{P_2}{P_1}$	$\frac{E_2}{E_1}$ or $\frac{I_2}{I_1}$
21	11.22	125.9	.007943	.0891
22	12.59	158.5	.006310	.0794
23	14.13	199.5	.005012	.0708
24	15.85	251.2	.003981	.0631
25	17.78	316.2	.003162	.0562
26	19.95	398.1	.00251	.0501
27	22.39	501.2	.00200	.0447
28	25.12	631.0	.00159	.0398
29	28.18	794.3	.00126	.0355
30	31.62	1000.0	.00100	.0316
40	100.00	10,000.0	.000,10	.0100
50	316.2	100,000.0	.000,010	.00316
60	1000.0	1,000,000.0	.000,001,0	.0010
70	3162.	10,000,000.0	.000,000,10	.000316
80	10,000.	100,000,000.0	.000,000,010	.00010

tation of the material could be improved. Some of this, however, is excusable. There is some overlapping and duplication but this could hardly be avoided as the book represents a collection of papers, rather than a unified textbook.

Also the matter of low frequency reverberation and its associated compromise between intelligibility and voice naturalness could have been discussed more completely. The whole question of dialogue equalization demands a great deal of thought and discussion as the problem is far from answered, at the present time.

The matter of head phone response as related to horn response is another question that could stand more discussion. Transient distortion and high frequency masking due to low frequency overload also could be expanded usefully. The field of film drive is very briefly mentioned and the present status of the non-slip printer could have been included.

While the field of film processing is well covered, considering its brevity, brevity seems out of place in this field and more quantitative data on amplitude distortion in both variable density and variable area prints could have

been presented. Again, the discussion of the pro's and con's of ultra violet light for recording and printing could have been materially extended.

Another reaction is that a more practical discussion would be valuable, of the acoustic problem facing the mixer on production, with the effects of set resonance, mike panning, difference between loudness and overload ratios in different characteristic voices, variation in "presence" with distance from the mike, synchronizing problems arising from playback delay and the inherent variability of microphones.

The discussion of volume level indicators is very useful but again the material could have been usefully extended to cover a more complete description of the newer peak reading instruments. The material on stabilized feedback, while accurate, is not as complete as it might be, considering the importance of the subject.

However, while it is easy to suggest extensions and improvements on the 503 pages of useful data presented in this volume, the reviewer admits that there is little that he would want to cut out of the book, and that mainly represents duplication of material due the previously mentioned overlapping chapters. To sum it up: while some of the

material is very elementary and some of the material is very advanced, it is all timely, up to date and useful and there is not a sound man in the picture business who will not be able to do a better job, whatever his work, after studying those parts of this Handbook which interest him.

Titles of the 39 chapters follow.

MOTION PICTURE SOUND ENGINEERING

PART I

- I—Basis of Motion Picture Sound.
- II—The Nature of Sound.
- III—Types of Film Recording.
- IV—Noise Reduction.
- V—Re-Recording and Preparation for Release.
- VI—Microphones.
- VII—Headphones and Loud-Speakers.
- VIII—Film Drive.
- IX—Film Processing.
- X—Reproducing Systems.
- XI—Sound Circuits.
- XII—Measurements in Sound Circuits.
- XIII—Phase Distortion.
- XIV—Transformers for Sound Circuits.
- XV—General Network Theory.
- XVI—Attenuation Equalizers.
- XVII—Equalizer Design.
- XVIII—Wave Filter Theory.
- XIX—Low-Pass and High-Pass Filters.
- XX—Dividing Networks for Loud-Speaker Systems.
- XXI—Vacuum Tubes.
- XXII—Amplifier Circuits.
- XXIII—Rectifiers.
- XXIV—Volume Indicators.

PART II

- XXV—Elementary Considerations.
- XXVI—Static Electricity.
- XXVII—Direct Currents.
- XXVIII—Electrical Power and Energy.

- XXIX—Magnetism.
 XXX—Electro-Magnetism and the Magnetic Circuit.
 XXXI—Electro-Magnetic Induction.
 XXXII—The Decibel.
 XXXIII—Resistance Attenuation Networks.
 XXXIV—Generators and Motors.
 XXXV—Alternating Currents.
 XXXVI—Vector Notation.
 XXXVII—Resonant Circuits.
 XXXVIII—Vacuum Tubes.
 XXXIX—Triod Amplifiers.

The material included in "Motion Picture Sound Engineering" is from lectures given to classes in Sound Recording conducted by the Research Council and prepared by L. E. Clark, formerly Engineering Manager RCA; John Hiliard, Transmission Engineer, Sound Department, M-G-M; Harry Kimball, Engineer, Sound Department, M-G-M; Fred Albin, Engineer, Sound Department, United Artists; and A. P. Hill, now of the Southern California Telephone Company and formerly Acoustic Superintendent, ERPI.

The Courses were under supervision of the Council's Committee on Industrial Education, under Chairmanship of Dr. J. G. Frayne of ERPI; Barton Kreuzer of the RCA; Dr. Burton F. Miller, Sound Department, Warners; William Thayer, Sound Department, Paramount; and Ralph Townsend, Sound Department, 20th Century-Fox.

J. N. A. H.

The Decibel Table

Most widely used figuring in sound work covered for practical use in latest Hawkins table.

The most widely used table in sound work is that which shows the relationship between the unit of sound intensity *change*—which is the Decibel—and the ratio of change expressed in the electrical equivalents of sound—Volts, Amperes or their product, Watts.

It should always be remembered that the Decibel is *not a unit of sound intensity*, but only a unit of the *change* in sound intensity.

The associated Decibel table is particularly convenient to use in that no computation, mental or otherwise, is necessary for its use in practical work. The first column is Decibels. The second and third columns cover gain, or amplification, and the last two columns indicate loss, or attenuation ratios.

For those unfamiliar with sound fundamentals, it should be explained that the use of a logarithmic unit, such as the Decibel is necessary when dealing with events producing stimuli on the human senses, because of a peculiar characteristic of the human nervous system. The human mind, which responds to the stimuli of outside events through

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PROGRESS never ceases in the construction of newer, bigger and more modern buildings for the motion picture and its allied industries. Top shows the modernistic exterior of the new Hollywood headquarters of Electrical Research Products, which adjoins the General Service studio. Below is a recent shot of construction work on the new four-story administration building on the MGM lot in Culver City. It adjoins the studio at the East gate and, of steel frame and reinforced concrete structure, will be 346 feet by 220 feet; and will house 277 offices for writers and executives. It was designed by Architect Claud Beelman along modern classic lines; will be air-cooled and have three elevators.

the eyes, ears and other senses, can only perceive *proportionate* changes in stimulus, rather than absolute changes in the amplitude of stimulus.

To the mind, a system of mathematics built around the series 1-2-4-8-16 etc., gives equal sensation increments between steps, while changes in stimuli which follow the series 1-2-3-4-5-6-7 etc., cause a constantly decreasing increment of sensation to be perceived by the brain.

In this connection it appears that the further development of television will necessitate use of the Decibel to express changes in light intensity, due to the fact that the contrast and definition, as perceived by the eye, will have to be expressed in a unit of logarithmic, or proportionate change, rather than in a linear unit such as foot candles.

J. N. A. HAWKINS, 695, IATSE

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A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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Close-ups

By ED GIBBONS

Ten years ago next month, International Photographer was launched on the stormy sea of journalistic enterprise by a small group of loyal and enthusiastic members of Local 659. Ira B. Hoke was editor, Art Reeves was advertising manager, and Charles P. Boyle, whose droll "Otto Phoens" column enlivened the magazine for many years, was treasurer. Seven of the advertisers in that first issue still make regular appearances in these pages; Smith and Aller and DuPont, on the inside front cover, J. E. Brulatour and Eastman on the inside back. Mole-Richardson, C. King Charney and Agfa, Fred Hoefner, Sam Landers, and Mitchell Camera Corporation.

During the past ten years, International Photographer has had many ups and downs, but never has it swerved from the constructive policies laid down by its founders. It has functioned primarily as a medium of good will and as a chronicler of technical progress. It has expanded its original metier until today it covers the news, not only of photography, but also of sound and laboratory practice, of sets, lighting, makeup, process and special effects, and of such fields closely allied to the motion picture industry and photography as radio, television and the graphic arts.

This expansion of news reflects indirectly the progress and development of the International Alliance of Theatrical Stage Employees, parent organization of International Photographers Local 659. Today in the Hollywood studios, sister locals: the huge Studio Mechanics Local 37, with over 7000 members, comprising the grips, gaffers, props, property makers, special effects, miniature makers, drapers, nurserymen, upholsters and other skilled crafts; Sound Technicians Local 695; Laboratory Technicians Local 683; Makeup Artists Local 706 and Costumers Local 705 all operate under a closed shop condition, which is a tribute to the power and solidity of the I.A.T.S.E. as the dominant theatrical union organization.

And through the power and support of the I.A.T.S.E., other American Federation of Labor bodies, the musicians, electrical workers, carpenters, teamsters, painters, plumbers, and machinists Hollywood local unions and the Screen Actors' Guild, also enjoy closed shop union conditions.

Prophetically enough the initial issue of International Photographer said: "The great machine of the 'I.A.' has been in operation for many years and its methods are JUST, FIRM and EFFECTIVE. We know that its policies are acceptable to the great majority of members of Local 659."

Recent events have proven that the statement made in February, 1929, is as true today as it was then, and that it applied not only to Local 659, but also to the sister locals that have progressed to importance since then. Despite disruptive influences that would seek to destroy the organization, the singular spirit and tradition that always has marked the I.A.T.S.E. throughout its history in theatre or studio, still is carried on by its loyal members, united under the present able administration of International President George E. Browne.

To pause and take stock of the progress of the past ten years, to examine and recapitulate the marvelous improvements in technical facilities and methods that have been made during that period, International Photographer is setting aside its issue of March, 1938, as a "Tenth Anniversary" number.

This special edition will be published as an expression of pride in a ten years' editorial record that is unblemished by either insincerity or prejudice, to mark the progress of International Photographers and the sister locals of the I.A.T.S.E. and as an expression of good will to the many friends of International Photographer in the motion picture studios and in the technical and supply fields serving the industry, whose fine support has contributed greatly to its successful publication during the decade just ending.

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Happy New Year!*

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ASTUTE exhibitors like Spyros Cardas of Loew's State Theatre in Los Angeles display keen showmanship by featuring Technicolor as a marquee draw. For they know Technicolor is box-office. By the same token, producers such as Walt Disney, Samuel Goldwyn, Mervyn LeRoy, London Films, Metro-Goldwyn-Mayer, Paramount, RKO-Radio, Selznick International, Universal, Walter Wanger, Warner Brothers, Max Fleischer, Leon Schlesinger, Screen Gems (Columbia release) and others will bring to the screen more features, cartoons and short subjects in Technicolor during 1938 than ever before. They, too, know the box-office value of Technicolor.

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Motion Picture Corporation



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PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

Hollywood, California

Vol. 10

No. 1



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Medieval Color of "Robin Hood" Captured by Camera



These rich stills on Warners' Technicolor production of "Robin Hood" were photographed by Schuyler Crail, member of Local 659, IATSE. They effectively capture the colorful and lavish production values of this picture, first important Technicolor

production with an expensive and spectacular historical background. Errol Flynn, Olivia de Havilland and Basil Rathbone, who are shown in above stills, have the principal roles in the picture as "Robin Hood," "Maid Marian," "Guy of Gisbourne."

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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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Business Manager, HELEN BOYCE.

Contributing Editors: LEWIS W. PHYSIOC, FRED WESTERBERG, D. K. ALLISON, GEORGE HURRELL,
J. N. A. HAWKINS.

Vol. X

Contents for February, 1938

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ON THE COVER: The beautiful and unusual picture of Carole Lombard on the front cover bears all the distinctive marks of effective lighting, composition and general technique to bring out the star's personality that identifies the work of George Hurrell, ace portrait photographer and a contributing editor of International Photographer.

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Shooting Mob Scene Stills.

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New Kalart West Coast Office.

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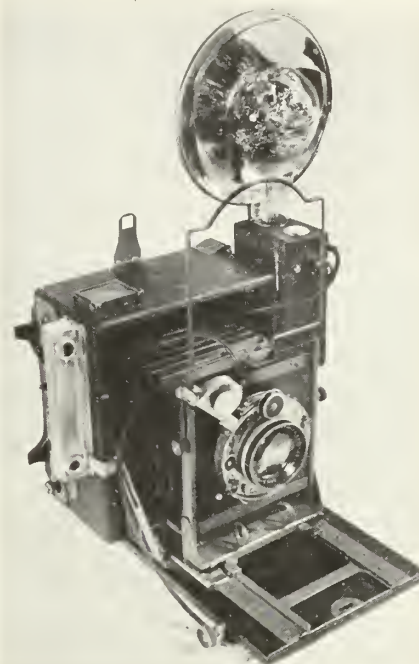
Toning Battery in at MGM.

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International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

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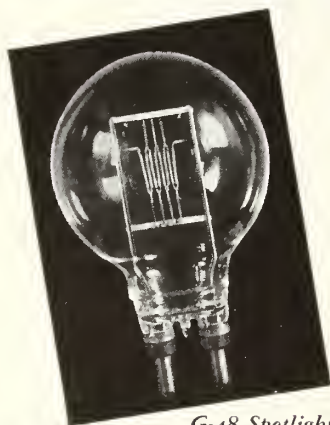
Behind the scenes during the shooting of Samuel Goldwyn's new \$2,000,000 Technicolor spectacle,

THE GOLDWYN FOLLIES



Producer:
SAMUEL GOLDWYN
Director:
GEORGE MARSHALL
Cameraman:
GREGG TOLAND A. S. C.
Studio Chief Electrician:
WILLIAM WHISLER
Still by:
ALEXANDER KAHLE

G-E MAZDA LAMPS *blend well with other light sources for Technicolor*



G-48 Spotlight

If you are shooting in Technicolor, just remember this: Thanks to new precision filters and the brighter, whiter light from G-E MAZDA lamps for color photography, *inkies now blend well with other light sources for color work.*

The candid shot above suggests how the camera crew of Samuel Goldwyn's new production "The Goldwyn Follies" are making use of this fact . . . and enjoying these important advantages provided

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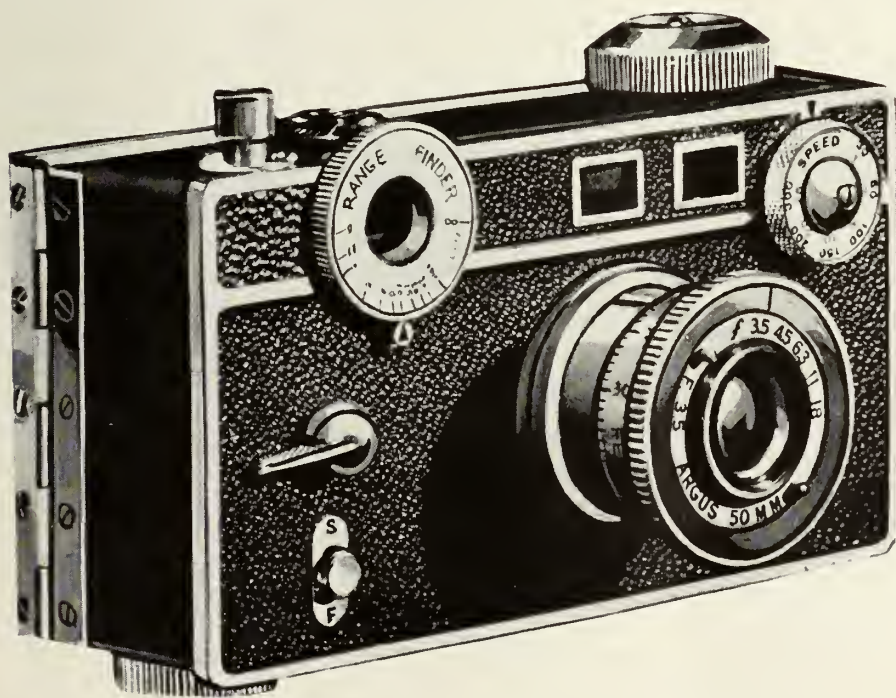
International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

Tradewinds

News of New Products

First information on the new \$25 Argus and the new Curtis Type "M" one shot three-color back for view cameras highlights the news of new products this month. New Eastman Kodak items, Zeiss projection lenses, a Graphic back for $3\frac{1}{4} \times 4\frac{1}{4}$ Speed Graphics, remote control for the Robot camera, an improved Model C Mendelsohn Speed Gun, portable dimmer banks from Otto K. Oleson, are other items reported on in handy factual form.



Here's the first picture of what the new \$25 improved Argus will look like when it goes on the market next month. Will be known as the Model "C" and is first 100 per cent American made and designed precision miniature camera. Dimensions are: $5\frac{1}{2}$ " long; $2\frac{3}{4}$ " wide; and 2" thick. Note the new type built in range-finder near top right corner of camera. This newest Argus model weighs 24 ozs.

Subject to more rumor and conjecture than any photographic item in recent years, the new Model "C" Argus camera, retailing at \$25, will be made available to dealers by International Research Corporation late this month or early in March. Production already is under way on the various parts, now that the designing job has been completed. The new camera will also have a complete line of coordinated accessories. It will be the first precision

made popular priced All-American made miniature camera, and will contain many features based on the manufacturer's study of public reaction to the original Argus, which, despite its various handicaps and limitations, swept into sensational success during the past two years.

Highlights of the new Argus are presented herewith along with the first picture of the new instrument. Full specifications and complete illustrations of

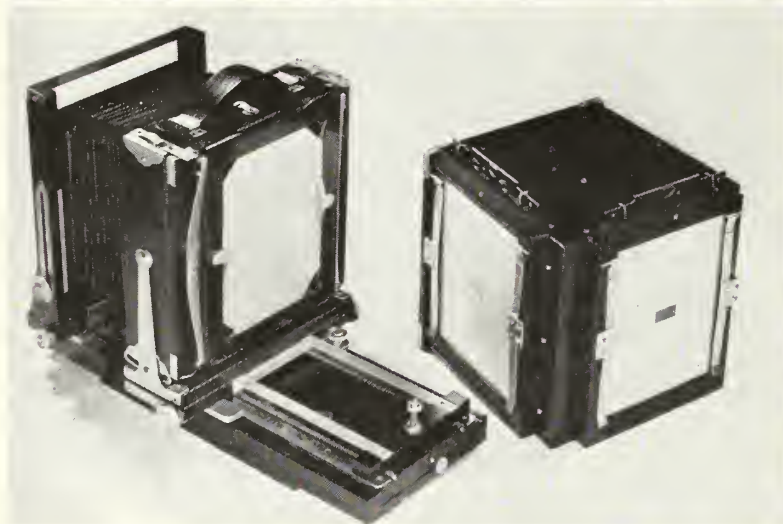
the camera's features will appear in the March issue of International Photographer.

The new Argus has a neatly proportioned and balanced case, trimmed in gleaming metal and polished plastic with black morocco leatherette covering. The striking appearance of the camera is enhanced by the use of diamond turned fittings of velvet smoothness. The inner case is of plastic mould, aiming at working precision with tough resilient strength and sturdiness, while avoiding excessive weight. The new model is compact, measuring $5\frac{1}{8}$ " long, $2\frac{3}{4}$ " high and 2" thick. It weighs 24 ounces.

The new Cinar f:3.5 lens necessitates accurate focusing and the Model "C" Argus is equipped with a built-in range finder. View finder and range finder eyepieces are placed side by side in a convenient position at the back of the camera. The optical view finder has a perfect infinity focus. The range finder is of the split sextant type and is built into the case body, making it an integral part of the camera where it is free from knocks or danger of breakage. Focusing the range finder is accomplished by a conveniently located knurled control knob. The image appears in full size with exceptional sharpness and distinction.

The film is advanced by a large and easily accessible winding knob and exposures are recorded by an automatic counter. Any type of 35 mm. double perforated film may be used in either 36 exposure daylight loading cartridges or the Agfa-Argus 18 exposure spools. This camera is especially adaptable to all types of color work.

The Model "C" will be supplied with Argus Cinar f:3.5 50 mm. lens as standard equipment. A new triple anastigmat lens, it is extremely fast and sharp, providing negatives that will stand great enlargement. The lens is fully color corrected and has a circle of confusion of $1/2000$ " on axis. It is equipped with a front operated iris diaphragm. Entire objective system moves as a whole in a helical mount and focuses from infinity to $3\frac{1}{2}$ feet. Additional spacer tubes for lengthening



New Curtis one shot three color back for view cameras, now being demonstrated at the major lots by Donald Hooper, member Local 683, IATSE, of the Curtis staff, is shown at Top Right attached to Anseo View Camera, with support to take weight off color unit; while Lower Right illustrates the color

back removed from the camera and support. Top Left, Hooper is demonstrating the color back to Ray Jones, Universal still department head; and Bottom Right to Cliff Maupin of 20th Century-Fox still department, with Warner Baxter as the subject. (For details see report starting on this page.)

focus will be available for copying and close-up work. With the latest ultra speed film this 3.5 lens is deemed adequate for most photographic work.

The lens is quickly interchangeable and a series of different type lenses are to be made available as additional equipment. The lens front mount is threaded to accommodate a new series of filters which screw into place. A new enlarger also will be marketed, on which the standard f:3.5 lens is used.

The Model "C" has a micromatic shutter of entirely new design and construction. It has a range of ten speeds from 1/5 second to 1/300 of a second including "Bulb." Other slower speeds are obtained for tripod or rest position of "bulb" setting.

The new model's shutter is of rugged

construction with few moving parts and a simplicity that insures dependable operation. It is located directly behind the lens and permits the advantage of interchangeable lenses. The location and operation is similar to the professional type movie camera. The controls for focusing, range finding and shutter operations are placed so they are at the finger tips, when the camera is held in a normal position.

PHOTOGRAPHY

PRODUCT: Type "M" One Shot Three Color Back for View Cameras.

MANUFACTURER: Thomas S. Curtis Laboratories, 2063-65 East Gage Avenue, Huntington Park, Calif.

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: Among special features of this new camera back are:

1. Focusing is done *through the rear* in the usual position most convenient to those accustomed to the ordinary view camera.
2. Illumination is but two stops lower than for ordinary black and white focusing and no filter is interposed to interfere with color composition on ground glass.
3. Red filter negative is made at top by reflected light and gives normal A-filter red record negative.
4. Special treatment of glass before coating prevents any ghost image. Glass is so flat that register is perfect at all focal positions of lens.
5. Optical system is fully compensated for refraction errors and register is critical if negatives are properly processed and protected from dangerous heat in enlarging.
6. Color Unit is fully baffled for flare or color bounce and perfectly even illumination of all three negatives is obtained.
7. Unit is balanced for incandescent, photoflood or photoflash illumination without compensating filter by slight variation in development. For arc or daylight a special compensating filter in optical glass is supplied.



Three new items from Eastman: Left, sportsman's type field case for Duo Six-20 Kodak; center, Twin Back for 3A Kodak; right, Cut Film and Pack tank, which handles wide variety of film sizes for developing in daylight. (See Page 7, Col. 3.)

8. Weston speed is from 2 to 4 in either artificial or daylight, depending upon contrast or flatness of lighting employed.

9. Camera can be operated with the same convenience as normal black and white; by leaving red filter holder in place, operator has merely to draw ground glass, place blue-green holder, draw two slides and expose.

10. All normal swing movements of view camera may be practiced.

11. Color Unit removed and replaced in vertical or horizontal position in ten seconds. Regular ground glass panel replaces Color Unit for black and white work on same view camera. Color record for guide may be shot on Dufay film through back aperture of Color Unit after separation negatives have been exposed and without removing Unit from camera, thus preserving lighting, angle and focus intact.

12. The new Type M Curtis Color Unit is made to take the standard Curtis Tripac 5x7 Holders, thus those who have a supply of such holders may not need to purchase additional holders when they buy a Type M Camera

or Color Unit. Every user of 5x7 Curtis Tripac Holders therefore must have a 5x7 view camera which could readily be fitted with the new Color Unit.

PRICES: Complete Type M Curtis Color assembly, illustrated herewith, Color Unit fitted to special Ansco View Camera with support to take weight of Color Unit, is supplied complete as shown, without lens at \$225.00. With special, color-tested, B & L H-B Tessar 12 inch focus in either Compound or Betax Shutter, complete at \$405.00. Two registering standard Curtis Tripac Holders included with above.

Complete field unit consisting of camera and color unit illustrated, with lens, lens shade and filter holder, 12 registering standard Tripac Holders numbered and matched for register in pairs (to make 6 exposures) packed in handsome fitted carrying case for camera and a similar partitioned case for film holders, sells for \$495.00. Excise tax included in above.

Color Unit alone sells for \$150.00 with two standard Tripac Holders and ground glass

panel registered to plane of holders.

Brace or support to take weight of Color Unit to attach to Eastman or Ansco Standard View Cameras, \$10.00.

Adapter panels to fit Color Unit to Century, Eastman or Ansco Studio Cameras, \$10.00.

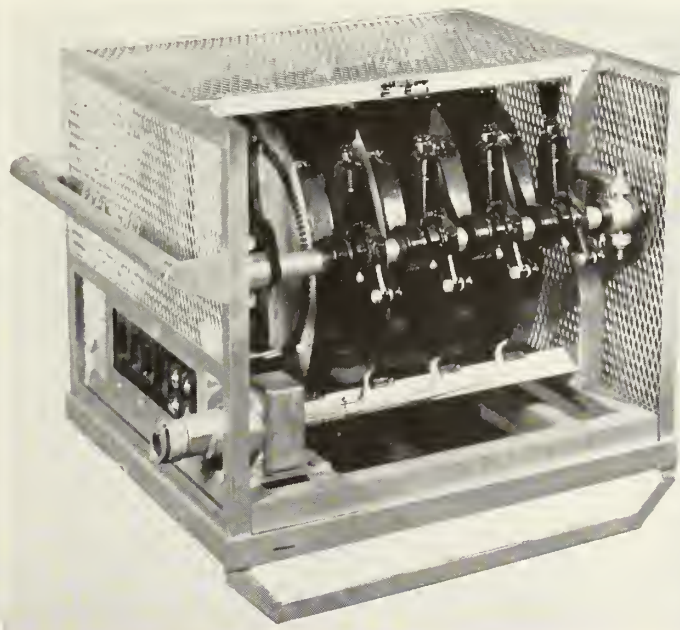
(Special adapter panels to fit Color Unit to any studio camera made to order at commensurate prices.)

NAME OF PRODUCT: Cut Film and Film Pack Tank.

MANUFACTURER: Eastman Kodak Company, Rochester, N. Y.

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: A new stainless steel developing tank for cut and pack film, incorporating a molded reel of novel design. It will accommodate all amateur film sizes from 4.5 cm. to 3 1/4 x 4 1/4 inches. Flexibility is obtained through use of two cores on which the molded reel flanges side. Notched markings on these cores enable user to adjust reel quickly to any of 12 film sizes. Once loaded reel is placed in steel tank and molded cover



Portable dimmer banks, manufactured by Otto K. Oleson Illuminating Company. Above is Model A, four plates of 5

K.W. each, and at right Model B, 4 plates of 3 K.W. each. (See Page 8, Col. 3.)

slipped on, developing, fixing and washing may be completed in daylight. Tank reel permits full circulation of solution and films are held in curved position to prevent buckling and contacting each other. Open design of reel helps avoid scratching film when loading.

SPECIFICATIONS: Tank accommodates 12 films up to $2\frac{1}{2} \times 3\frac{1}{2}$ and six films of $2\frac{1}{2} \times 4\frac{1}{4}$ or $3\frac{1}{4} \times 4\frac{1}{4}$. Internal assembly units may be purchased separately.

PRICES: \$10, complete. Internal assembly, \$6. Tank with molded cover and steel cap, \$4.50.

NAME OF PRODUCT: Kodak Duo-Six-20 Field Case.

MANUFACTURER: Eastman Kodak Company, Rochester, N. Y.

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: A new sportsman's type field case of the instant action type, similar to those recently brought out for Kodak Bantam Special and Retina II. Made in two sections and if desired the whole outer section can be removed and carried in pocket. Unsnapping a single fastener allows outer section to swing down, flap-fashion, out of the camera's field of view.

SPECIFICATIONS: Heavy case-stock brown leather. Inner section, which holds camera, lined with maroon velvet over spring steel frame which clasps camera snugly. Neck straps attach to frame at upper corners, as illustrated. Protecting outer section is attached to inner section by three glove-button fasteners.

PRICE: \$8.50.

NAME OF PRODUCT: Kodak 3A Twin Back.

MANUFACTURER: Eastman Kodak Company, Rochester, N. Y.

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: Cutting picture taking costs in half is possible with 3A Kodaks, Series II, by using this new "twin-exposure" camera back. Permits taking 11 pictures $2\frac{1}{2} \times 3\frac{1}{4}$ on roll of regular six-exposure film of size used in 3A. Can be installed at any good camera shop and replaces regular back. Metal mask slips inside camera to frame smaller picture area and twin back has two ruby windows for checking film numbers. Film is wound until number appears in first window, picture snapped, then film is wound forward until same number appears in second window, and so on to end of roll.

SPECIFICATIONS: New back as illustrated features special mask for smaller picture; swing covers are provided for ruby windows when supersensitive panchromatic film is used; slip-on masks are supplied for the camera finder to outline area which smaller size pictures will include.

PRICE: \$5.

PRODUCT: $3\frac{1}{4} \times 4\frac{1}{4}$ Speed Graphic Camera.

MANUFACTURER: Folmer Graflex Corporation, 154 Clarissa St., Rochester, New York. (Main 3131).

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: The above camera is now available with a Graphic Back (with spring suspended focusing panel attached) to accept Graphic Holders rather than Graflex Holders as previously supplied. $3\frac{1}{4} \times 4\frac{1}{4}$ Graphic Press Cut Film Holders are available for it. This gives the smaller camera the same versatility enjoyed by the 4x5 Graphic.

SPECIFICATIONS: of the camera are unchanged except for the back which has been redesigned to accept the Graphic type holders. The new smaller Graphic holders are patterned exactly after the 4x5 Graphic Press Cut Film Holders.

PRICE: The camera without lens, with one holder is \$80.00. Additional holders are \$2.75 each.



New Robot Remote Control Release.

PRODUCT: Robot Remote Control Release.

DISTRIBUTOR: Intercontinental Marketing Corporation, 10 East 40th St., New York City, (LEX. 2-7788).

GENERAL DESCRIPTION: This accessory for the rapid fire Robot miniature camera permits the photographing of one to 24 shots singly or in rapid succession without approaching the camera itself. It contains a plunger, activated by an electric magnet which controls the release. Operation is powered by economical flashlight batteries and controlled by a push-button connected to the camera by a wire of any required length. Since the Robot has automatic film transport and shutter release, this assures unusual opportunities for novel and difficult shots.

SPECIFICATIONS: The control release, attaches easily to the Robot as illustrated and is 1" in diameter, 4" high.

PRICE: \$21.50.

PRODUCT: 1938 Model C Speedgun.

MANUFACTURER: S. Mendelsohn, 202 E. 44th St., New York City. (Murray Hill 6-3298).

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: An improved Model C Speedgun, similar in operating principle to the Model C Speedguns which have been in newspaper and professional use on Speed Graphic cameras. Improvement consists of a permanent lens board mounting bracket for the Magnetic Tripper which cannot become dislodged through use; permits raising or lowering of lens board without interference with timing. Model C Speedgun as now designed may be used with any standard make of flash bulb or between-lens shutter. No adjustments need to be made as Speedgun is set for immediate use at factory.

SPECIFICATIONS: Model C Speedgun, 1938 model now supplied in full chrome plate. Choice of Temporary and Permanent Lens Board mountings. Standard 7 inch polished aluminum reflector, 7 inch Aplanatic optional at \$2 extra. Uses three standard 1.5-v. dry cells. Accessories include side lighting devices which operate two to ten flash bulbs in perfect synchronization at any speed. Remote control. Tandem control.

PRICES: \$14.25 (\$1.50 higher west of Rockies).

PRODUCT: Jena Optical Glass Color Filters.

MANUFACTURER: Jena Glass Works, Schott & Gen., Jena.

DISTRIBUTOR: Fish-Schurman Corporation (Hollywood Camera Exchange, agents for West Coast), 250 East 43rd St., New York City.

GENERAL DESCRIPTION: Jena Optical Glass Color Filters are made of Jena optical glass, dyed in the mass, uniformly colored throughout. These filters are stable and will not fade. Accurately reproducible. Jena Filters are available for all amateur and commercial photography and have the same light transmitting properties as the popular Wratten types, that is, K-series, X-1, X-2, 21, 23A, 25A, 29F, 70, 88, Aero 1 and 2, tri-color filters for ultra-violet and infra-red work, filters for photomicrography, also types 18-A and 2-A.

SPECIFICATIONS: Available from stock in the following sizes: 32, 39, 51 and 76 mm. diameter, 51 and 76 mm. squares. Other sizes can be procured on order.

PRICES: Range from \$3.

LIGHTING

PRODUCT: Portable Dimmer Banks.

MANUFACTURER: Otto K. Olesen Illuminating Co., Ltd., 1560 Vine St., Hollywood, Calif. (GL. 5194).

DISTRIBUTION: Rented and sold by manufacturer.

GENERAL DESCRIPTION: For control of lamps on motion picture stages. Aids in balancing, and for effects. Saves globes, eyes, juice. Banks are constructed with Ward-Leonard plates, mounted in steel frames, milled for accuracy and electrically welded for permanence of alignment. Constructed to stand hardest service. Each bank is housed in perforated metal for safety to personnel and protection to mechanism. Each plate is fused and may be individually operated. All plates of each bank may be interlocked or several banks may be interlocked for one-man control of every lamp on the set. Full length handles welded to chassis plus large ball-bearing, silent casters enable one man to handle easily.

SPECIFICATIONS: Model A: Four plates, 5 K.W. each. Cadmium plated terminal bars, fuse clips and controls all mounted on same side. Model B: Four plates, 3 K.W. each. Equipped with plug fuses and standard stage pockets.

RENTAL: 30c per KW/day. Purchase prices on application.

PROJECTION

PRODUCT: Zeiss Ikon Kinospar and Kipronar lenses.

MANUFACTURER: Zeiss Ikon A.-G., Dresden, Germany.

DISTRIBUTOR: (For U. S. A.) Eric W. Schumacher, 160 Fifth Avenue, New York City. (CHelsea 3-7176). (Sub-agent for Calif.) O. Staplefeld, 1584 W. Washington St., Los Angeles, Calif.

GENERAL DESCRIPTION: Although for many years the most widely used projection lenses in Europe, Zeiss Ikon projection lenses are now for the first time available in the United States. Both the Kinostar and Kipronar series are uniformly cylindrical and have exceptionally large free apertures. The lenses themselves are made of the famous Zeiss optical glass and are typical examples of Zeiss precision workmanship. The Kinostar series is achromatic and the Kipronar series is both achromatic and anastigmatic.

SPECIFICATIONS: Kinostar series, 52.5mm and 62.5mm in diameter, foci from 8 cm (3.15") to 20cm (7.87"); Kipronar series, 80 mm diameter, foci from 12cm (4.72") to 14cm (5.51"), speed F:1.9; Kipronar series, 100mm diameter, foci from 15cm (5.90") to 20cm (7.87") speed F:1.9.

PRICES: Upon application.

Camera

CINEMATOGRAPHY

For the further convenience of readers, International Photographer will in the future divide all news under the heading, "Camera," into two sections, one dealing with cinematography, the other with photography, under those sub-headings.

Technicolor System

Methodical routine developed in co-operation with Selznick International benefits all color productions.

Because Selznick International Pictures was the first major studio to adapt its production program to the extensive use of Technicolor, and for the past two years has been almost continuously engaged in Technicolor production, an effective and widely copied



NEW TYPE MITCHELL CAMERAS, which recently went into production after years of experimentation and designing, are illustrated in top strip above, while bottom strip shows the new Mitchell mounted on a dolly for tests currently being conducted at Warner Brothers-First National with the view of adding a group of the new cameras to the studio battery. First cameraman in checked coat is Ernie Haller; Buddie Weiler, assistant, is shown with hand on camera, while to his right is Wesley Anderson, second cameraman. Stills are by Madison Lacy, Local 659, IATSE. Testing of the new cameras is being supervised by Mike McGreal, studio camera department head. As clearly

illustrated, the new Mitchell features convenient fool-proof operation. It also is unusually mobile, weighing but 140 pounds. Super silent action is the big feature of the new camera, which incorporates all standard Mitchell features. No blimp is required, hence, there's no shooting through glass and all controls of the camera are on the outside. New type mechanism on outside of camera automatically provides for parallax in using the finder, and focuses it while focusing lens. The camera also has an automatic dissolve. Operators can shift over from outside for focusing, and the very silent operation, through freeing operation of the camera from blimp restrictions, permits greater ease and efficiency in handling the new Mitchells on the set.



PUBLIC ADDRESS SYSTEM is a feature of the camera shown in this novel still of Director H. Bruce Humberstone and camera crew, photographed from the actor's vantage point by Ray Nolan, member of Local 659 IATSE. The microphone inside the blimp and loud speaker visible at top form special set-up designed and built for Twentieth Century-Fox by the Capitol Radio Television Supply Company. It permits cameraman to instruct actors and technicians without removing head from inside the blimp. A special feature is a two-switch hook-up by which cameramen can instantaneously switch on or off either the amplifier or mike. Disconnecting the mike eliminates any amplifier hum during actual shooting and recording. Director Humberstone recently won many plaudits for his handling of the Chicago fire scenes in "In Old Chicago." He now is directing Jane Withers and Rochelle Hudson, shown above, in "Gypsy" for the same studio. Above Humberstone in checkerboard scarf stands cameraman Edward Cronjager, Jr.; with William Whitley, second cameraman to his right and Henry Cronjager, Jr., assistant, in front of Edward Cronjager, Sr. Extreme left, cableman Roy Martin.

system of co-operation between studio technicians and Technicolor laboratory experts was developed at the Selznick lot.

This systematizing of production routine, developed in the experience of virtually continuous production on color features at Selznick International, is a typical example of industry technical cooperation that has proven beneficial to other companies. The constant struggle for better and better color is reflected in such current pictures as Paramount's "Ebb Tide," "Goldwyn Follies" and Warners' "Robin Hood" and "Gold Is Where You Find It." Such improve-

ments in production efficiency are playing a big part in the greatly increased regard for color reflected in 1938 production plans of most companies.

The chief points of contact between the studio experts and the laboratory technicians of Technicolor, were more artistic than mechanical, however. Scene builders, set dressers and wardrobe heads had a lot to learn about the use of color on the sound stages.

Technicolor films are taken directly to the laboratory to be developed and printed, because exact performance of the manifold operations involved, could not be attained outside the Technicolor

laboratory. For example, it may be noted that mechanical tolerances in a Technicolor camera must not exceed .0002 of an inch, and that careful adjustment of this delicately balanced and close fitting machinery is possible only at the Technicolor factory.

All color magazines, therefore, have to be cased at the plant, and the studio cinematographers have nothing to do but to check the color magazines out, and record the time the finished prints are returned.

The other studio technicians must co-operate more closely. The head electrician must be ready to produce the different kinds of lighting used in color pictures, and provide the necessary equipment. He must consult the Technicolor men each day, in preparation for the next day's shooting.

The head cameraman employed at the studio must have rather close professional relations with Technicolor's head cameraman. Not only must the Technicolor crew operate the cameras used—one to three on a picture—but the head cameraman for the picture must follow closely the suggestions of the experts on the Technicolor staff.

Members of the studio's wardrobe and set building departments must consult with the Technicolor men in order to learn of the latest discoveries in lighting and the use of color in various scenes.

The use of color on the screen is still a comparatively new art, and possibilities not yet entirely realized, may be controlling influences in the art tomorrow.

For example, although the eight existing Technicolor cameras, costing \$40,000 each, are in daily use on three continents, there is reported to be a disinclination to build more of these costly instruments, because of new developments by Technicolor in the use of color films.

The Technicolor Company and Eastman are developing various phases of a new process which will permit all colors to be recorded on the same film, instead of on three separate ribbons as at present. (Int. Photog., July, Sept., 1937).

MGM's "Test Pilot"

Studio's first air picture in several years had 35 days of location shooting to insure absolute accuracy.

MGM's "Test Pilot," the studio's first air picture in more than two years, is a cameraman's dream. Nature of the story, dealing as it does with the most daring, reckless men in the world, lends itself to thrills. It was the cameraman's job to capture every one of those thrills, to bring them to the screen as

“TEN BEST” ON EASTMAN FILM EXCLUSIVELY

EVERY one of the “Ten Best Pictures” selected in the 1937 critics’ poll of the *Film Daily* was “shot” on Eastman Super X Panchromatic Negative Release prints for all ten were made on Eastman Positive An impressive double demonstration of Eastman’s current contributions to motion picture quality. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

**EASTMAN *Positive* and
*Super X Negative***



SONJA HENIE in action series, which though preserving excellent match in negative quality and seeming sequence, were not made with a sequence or "magic eye" camera. This strip selected from a series of 4x5 Speed Graphic shots made by Frank Powolny.

they actually happened on a half-dozen landing fields.

When the studio bought Lieutenant-Commander Frank Wead's story, executives decided to make the film authentic to the last detail, to shoot as many scenes on location as the script permitted.

As a result, the "Test Pilot" company has ranged the airports of Southern California, utilizing Metropolitan Union Air Terminal and Mines Field in Los Angeles, traveling to Lindbergh Field in San Diego, and winding up with a two weeks' stay at the Army Post, March Field, near Riverside.

The picture will be in production for 70 days. Thirty-five days were spent away from the studio, making aerial scenes, photographing every modern type of airplane.

Head Cameraman Ray June had a job on his hands. It was his responsibility to provide the spectacular aerial background for the romance between Clark Gable and Myrna Loy.

Taking no chances for the location scenes, June placed nine aerial photographers in airplanes, scattered nine other cameras at strategic points on the field. Every angle of the flight was covered by at least five of the cameras simultaneously.

Then June did something that few top-flight cameramen in motion pictures have attempted in recent years. Removing the cabin door from a big ship, he had a motion picture camera fastened to the fuselage, went up in the air himself for pictures. He didn't wear a belt, had no means of holding on except his camera. The camera was so stationed that it could sweep the sky from wing tip to rudder. The pilot of the plane was instructed to fly as closely as possible to other ships in formation, to go above them, drop below them.

June then did a seemingly foolhardy thing. Standing by that open door, with the camera his only means of holding on, he told the pilot to follow a test pilot in a power dive.

When the ship finally landed, June was exhausted, but he had the pictures he wanted. Later showing of "rushes" in the studio projection room proved that to his satisfaction. He had made the first authentic pictures, close-up, of an airplane being put to the test of the power dive. Other pictures had been made with telephoto lens, but June had stayed with the diving ship, getting his pictures first-hand.

During one day at March Field, June

was in the air, standing by the open door, for eight hours. Field officials estimated that he had covered 1500 miles in those eight hours.

He obtained photographs of planes above clouds, shooting down from an altitude of 12,000 feet. He has thousands of feet of planes at sunrise and sunset, planes in formation, stunting, power diving and just plain flying.

"Test Pilot" marks a departure from the average aviation picture in that the flying scenes have benefited from modern improvements in photography and in aviation itself. Audiences will be treated to a startling and spectacular series of air sequences which were made by cameramen coached in aerial work.

PHOTOGRAPHY

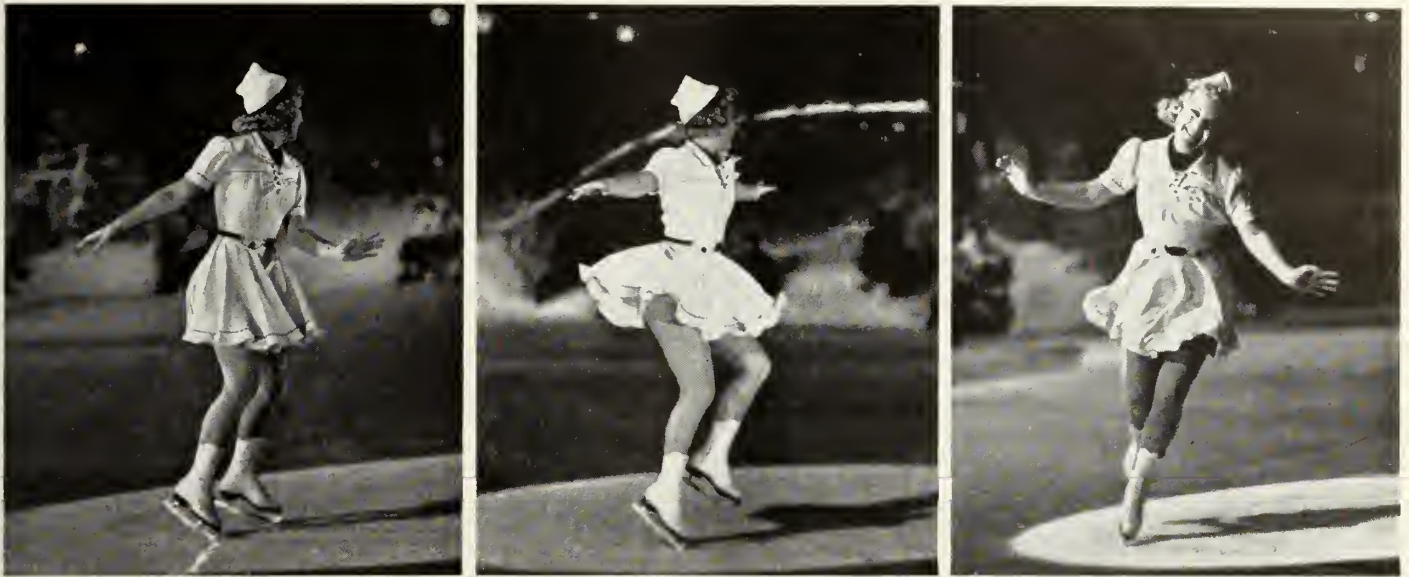
Shooting Mob Scenes Stills

Motion picture stillman only professional photographer shooting big crowd scenes regularly for publication, and he does an excellent job under many handicaps.

Even a casual study of current publications, from newspapers to the slick magazines—and whether from the current crop or those of recent years—invariably will reveal a great dearth of large group pictures, mob scenes, outdoor or indoor shots of many people, with the one outstanding exception of the batch of still pictures that come from the motion picture studios. Probably the only photographic group, regularly contributing professional work to the printed page who must ever be alert and competent to handle this type of photography, often under adverse circumstances, are the studio stillmen.

There are no retakes for the still photographer in motion picture work on such big scenes, featuring hundreds of extras in costly sets. These expensive sequences in productions generally are cleaned up in from several days to a week of shooting; and the particular combination of people and backgrounds seldom ever is again reassembled thereafter. Yet this sort of still picture is the most impressively convincing publicity and exploitation medium to get over to theatre operators and the paying public the production and eye appeal of costly motion picture productions.

Even with fast lenses and film, the



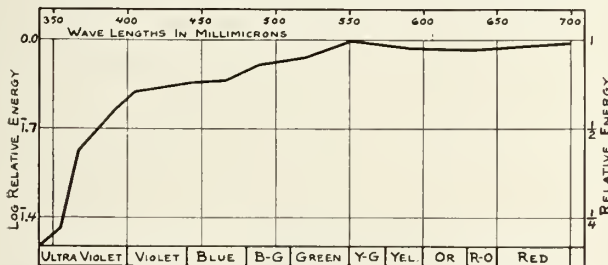
member of Local 659, IATSE, during production of the Norwegian skating star's latest picture for 20th Century-Fox, "Happy Landings," which was released last month. In the original negatives, the poses of Miss Henie varied slightly in size.

The CINEMATOPHOTOGRAPHER'S BOOK of TABLES

By Fred Westerberg

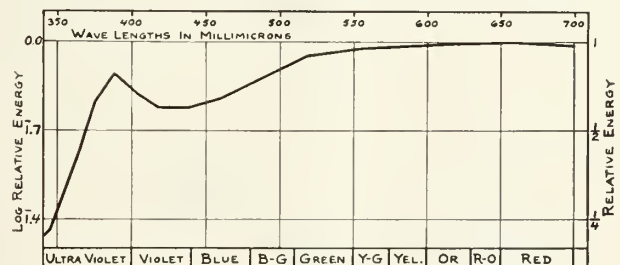
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SPECTRAL ENERGY DISTRIBUTION CARBON ARC LIGHT—POSITIVE CRATER RADIATION

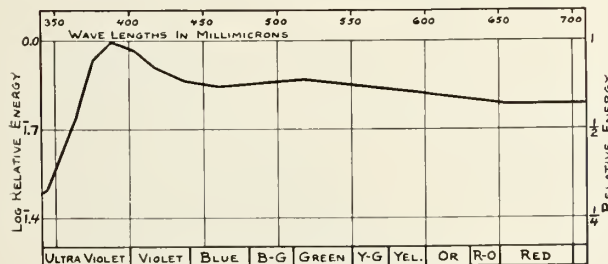


8mm Motion Picture Studio Carbon. 40 Amps. 37.5 Volts D. C. Used in M-R 27 Scoops and M-R 29 BroadSides for B&W and Color.

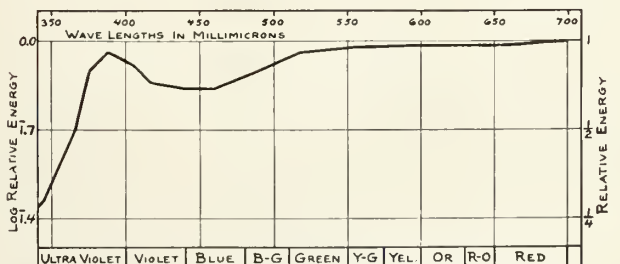
SPECTRAL ENERGY DISTRIBUTION CARBON ARC LIGHT—POSITIVE CRATER RADIATION



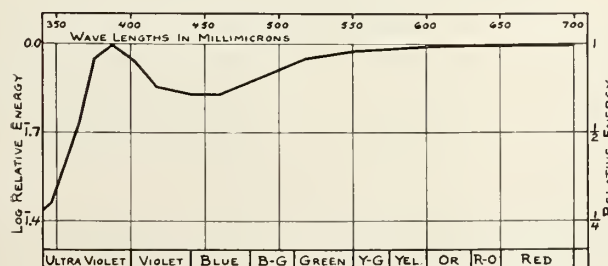
13.6mm High Intensity Carbon thru Y-1 Filter. 125 Amps. 63 Volts D. C. Used in M-R 90 Spots for B&W or Color.



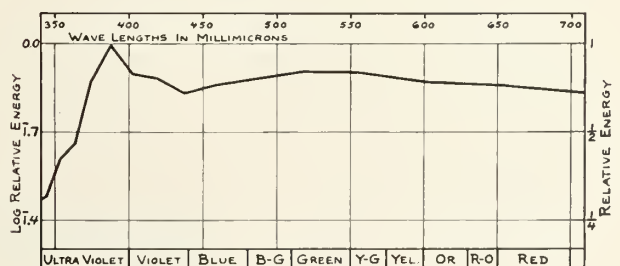
16mm High Intensity Carbon. 150 Amps. 81 Volts D. C. Used in M-R 170 Spots and Sun Arcs without filter for B&W only.



9mm High Intensity Carbon thru Y-1 Filter. 70 Amps. 49 Volts D. C. Used in M-R 65 Spots for B&W or Color.



16mm High Intensity Carbon, thru Y-1 Filter. 150 Amps. 81 Volts D. C. Used in M-R 170 Spots and in Sun Arcs for B&W and Color. Data by National Carbon Company



13.6mm Super High Intensity Carbon. 185 Amps. 75 Volts D. C. Typical of Carbons used in Background Projection. Data by National Carbon Company

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H. Nassibian, Cairo, Egypt

stillman's job of capturing interesting flashes of the big scenes for the exploitation records is one that presents many problems. It is to the credit of the studio photographers that under the circumstances they turn in so many fine exterior and mob shots in the regular routine of covering a production and the number of studio stillmen who can handle this type of photography constantly and expertly is not few.

Passing up the technical factors of photography, which in the final analysis either are matters of proven method or of personal taste, the stillman's problem, in shooting this type of picture primarily are those of judgment and proper timing in handling people. These problems are emphasized in that there are still much too many participants in motion picture production who regard the stillman as an interfering pest and delayer of production schedules.

Regardless of the type of picture, the studio stillman frequently is dependent almost entirely on diplomacy and tact in securing adequate poses for his pictures; but the situation is aggravated when the directors and their assistants—trying to save time and expense on huge sets—cause the stillman to be rushed about from pillar to post without a proper opportunity to record the production story in shots that will play a vital part in selling the picture. These single minded people frequently are prone, as John LeRoy Johnston pointed out in a recent article in *International Photographer*, to grievously underestimate the direct importance to themselves of a good set of stills, packed with selling punch for their pictures.

Shooting this type of picture also is complicated by the very nature of production activity and the constant helter-skelter and motion that takes place on a big set. The stillman's job primarily is to freeze everything within his view finder into a clear and reproducible negative. The picture suffers if but one or two persons happen to move when the shutter is snapped and thus blur part of the picture.

Consequently the success of studio stillmen in constantly turning in sharp, good quality pictures of opulent and heavily peopled scenes is accomplished by the use of scores of little tricks and stunts. It takes not only an accurate eye and a fast thinking mind but years of training and experience to record this type of scenes with assurance and success.

There is generally a point in every motion picture scene at which there is no given action, that is, one particular instant from the time they prepare to record the take until the actual shot is taken. The alert stillman watches carefully for this one second, or fraction of a second, when everyone seems to stand still. Set to make his shot at

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unharmd by 800-foot fall!

*Eyemo Camera Dropped by Newsreel
Cameraman, Al Mingalone, in Sensational
Runaway Flight Recovered Uninjured*

● The press, in September, carried the story of the balloons which broke loose from their mooring, carrying with them Paramount News cameraman Al Mingalone. It related how he was brought to ground by the puncturing of the balloons with rifle fire from the ground. But there is an interesting sequel to the story.

With him, Mingalone carried a Bell & Howell Eyemo. After the guy rope broke, releasing him to the mercy of the skies, he was forced to drop this Eyemo from a height of 800 feet.

The camera was later recovered, freed of the mud into which it had fallen, and found upon thorough inspection to be wholly intact without the slightest injury.

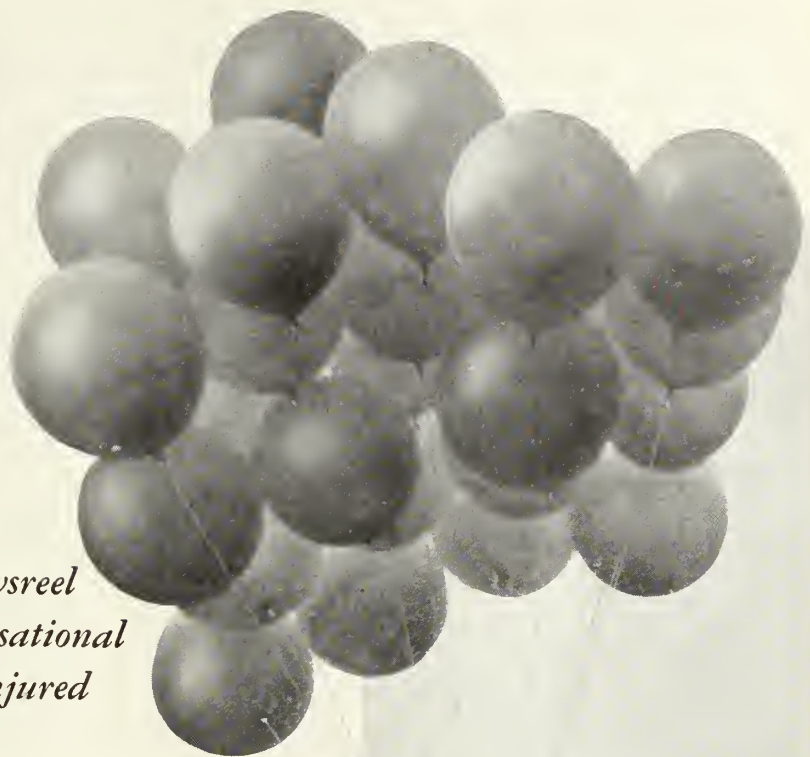
Lest we be misunderstood, we believe that in this remarkable instance Mr. Mingalone's thanks to the Eyemo's sturdy construction should be shared with a kind Providence.

The Eyemo owes much of its favor among professional newsreel cameramen to its sturdy construction, its ability to stand up in grueling newsreel service. Small and compact, the Eyemo permits getting scenes impossible with larger cameras, yet can be equipped with many of the refinements of studio cameras. Mail the coupon for detailed information.

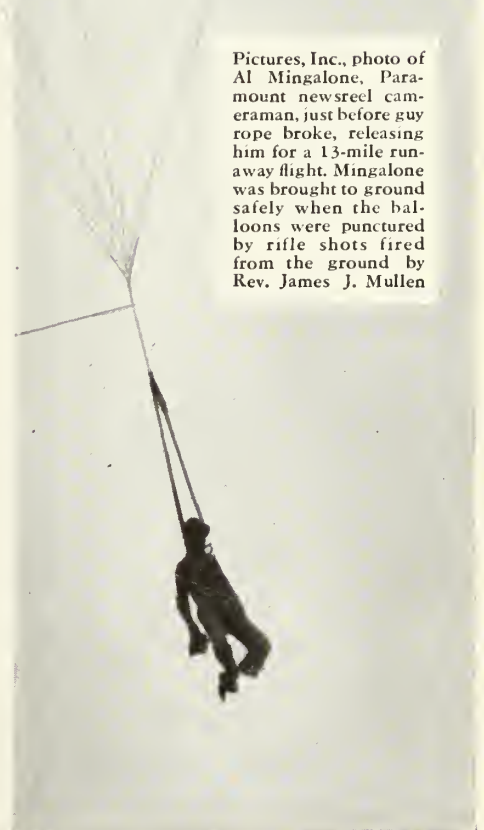
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The new Eyemo, more versatile than ever before, is replete with such features as three-lens turret, focusing and diaphragm controls visible through spyglass viewfinder, interchangeability of auxiliary electric motors and external film magazines, standard S.M.P.E. sound aperture, and accurate vibrationless speed governor. Send for complete description



Pictures, Inc., photo of Al Mingalone, Paramount newsreel cameraman, just before guy rope broke, releasing him for a 13-mile runaway flight. Mingalone was brought to ground safely when the balloons were punctured by rifle shots fired from the ground by Rev. James J. Mullen



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a speed, say 1/250 of a second, the veteran stillman frequently gets pictures of sharpness and quality and at the same time without movement of any of the characters to blur the picture.

In talking to Wally Wallace, he tells me usual success in getting group shots is attainable through an approach used seldom by the other stillmen, at least to my knowledge. Wally sets the camera, gauges the angle, gets everything ready and then just as soon as the director says "cut" he shoots the scene. It is his contention that when the word "cut" is uttered by the director the characters momentarily relax, yet the movement is comparatively of so small a degree that it is possible to make the shot without fear of blurring the scene.

I have watched other stillmen do this kind of work too, and they tell me that they always resort to various unique methods and trick cues for themselves in taking this kind of a shot. Mickey Marigold, snapping many of the scenes for Warner's "Hollywood Hotel," would talk to a group of about 100 people in the scene and as he would finish saying "Hold it, now," would press the bulb and get the shot before the players were aware what he was doing. This way he caught them relaxed and natural yet in a quiet state. Had he repeated time and time again that he was about to take a shot, the natural tendency to strike a pose would have caused some of the people to move.

Often to cover himself a stillman will shout "Let's take another one—someone moved!" This is done as a matter of caution. It often results in a better still because the players when they hear of a thing like this, as is usually the co-operative tendency of motion picture workers on the set, will put forth their best efforts to help the photographer produce the finest results.

In filming many of the scenes of "The Buccaneer," which is illustrated herewith, much stress was laid on exteriors because these spectacular pictures with expensive production value require many good exterior shots to properly service newspaper publicity and lobby stills. And in this connection, the film's producer-director, Cecil B. DeMille, should be cited as a para-

Typical of the effective work of studio stillmen in capturing graphic shots of big group scenes for picture exploitation are these scenes. On opposite page are two colorful shots from Cecil B. DeMille's Paramount production, "Buccaneer," made by G. E. Richardson. Two top pictures on this page are from RKO-Radio's "Radio City Revels," and were made by Gaston Longet. Scene at bottom is from the still series shot by Cliff Maupin and Frank Powolny on 20th Century-Fox's "In Old Chicago." All the photographers are members of Local 659, IATSE.



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PACIFIC CINE FILMS

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gon among directors and producers in handling the still situation. DeMille takes a keen and intelligent interest in the work of assembling the still set on his productions. He takes time each morning to check the results of the previous day's shooting and make constructive comment and suggestions. DeMille's policy is both good business judgement and good showmanship as evidenced by the effective pictorial exploitation all his productions have received.

A type of picture that must rely heavily on stills for its exploitation barrage is the film musical and operetta. Prints from the RKO-Radio still department's file on "Radio Revels," illustrated on an accompanying page, are typical of the well thought out pictorialization of the big production moments in this type of film.

Another instance of showmanship value stills obtained under adverse circumstances of scenes that cost into the hundreds of thousands and could never be snapped again, is the exploitation series for the big sequence in 20th Century-Fox's "In Old Chicago," a colorful sample of which is reproduced along with the RKO-Radio pictures.

HERBERT ALLER.

would still remain a second set of negatives of the films. These are to be stored in fireproof vaults.

Local 659 Grads

Two International Photographers members, Miller and Dr. Sorenson, enter legal and medical professions.

Two veteran members of International Photographers, Local 659, have entered the professions and one has opened offices in Hollywood. Sidney Miller, who has ben in the camera department at 20th Century-Fox, recently was admitted to the bar, while E. J. Sorenson, a veteran of silent picture days, who in recent years has been with the Mayo Brothers in Rochester, now is established as a medico in the Taft Building in Hollywood. Sorenson was active as an assistant and later as a first cameraman from 1923 to 1927, when he photographed Eric Von Stroheim's "Wedding March." In 1929 he was in RKO's cutting department, but left in 1930 to join the Mayo clinic.

New Kalart Office

Synchronizer and range finder manufacturers opening Hollywood branch for sales and service.

Chandler Weston, son of Edward Weston, famed California photographer, has joined the Hollywood staff of the Kalart Company as technical and service man. West Coast offices of the range-finder and synchronizer manufacturers will be opened this month, to provide the Coast dealers with sales and service facilities, with all deliveries f.o.b. Hollywood, under Lida Dubin, western representative of the company. Weston and Miss Dubin will visit camera clubs, schools and colleges on the Coast, delivering lectures and demonstrations on synchronization photography.

Kodabrom Liked

New Eastman enlarging paper, aimed to fill needs of commercial and press work making hit due to wide latitude.

Number of improvements evident in Eastman's new Kodabrom enlarging paper is making a hit for the product with professional and commercial photographers and finishers. Its main feature is wide latitude, which suits it particularly to the needs of those who must handle many enlargements from negatives of widely varying densities, and still strive for uniform quality in prints, particularly for printed repro-

Security Film Files

Accounts of 37,000,000 social security applicants recorded on 16mm. film for permanent record.

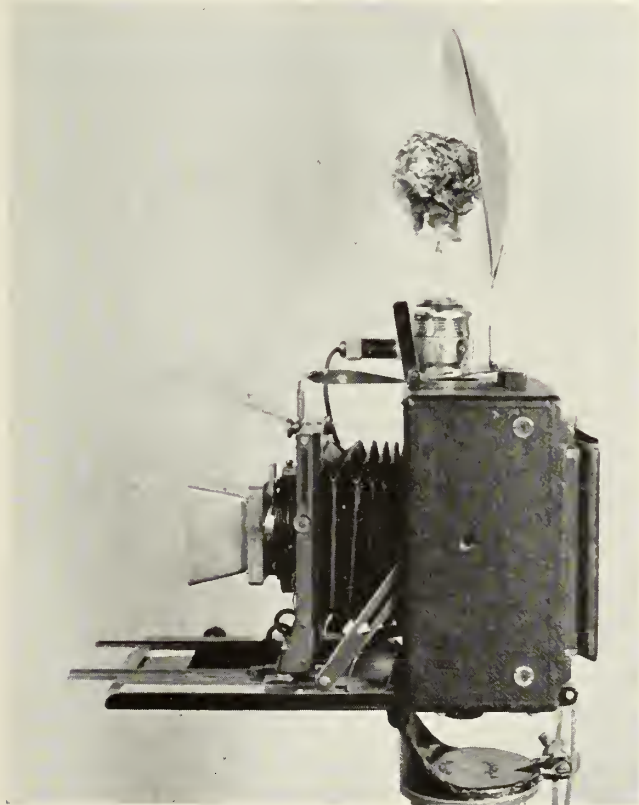
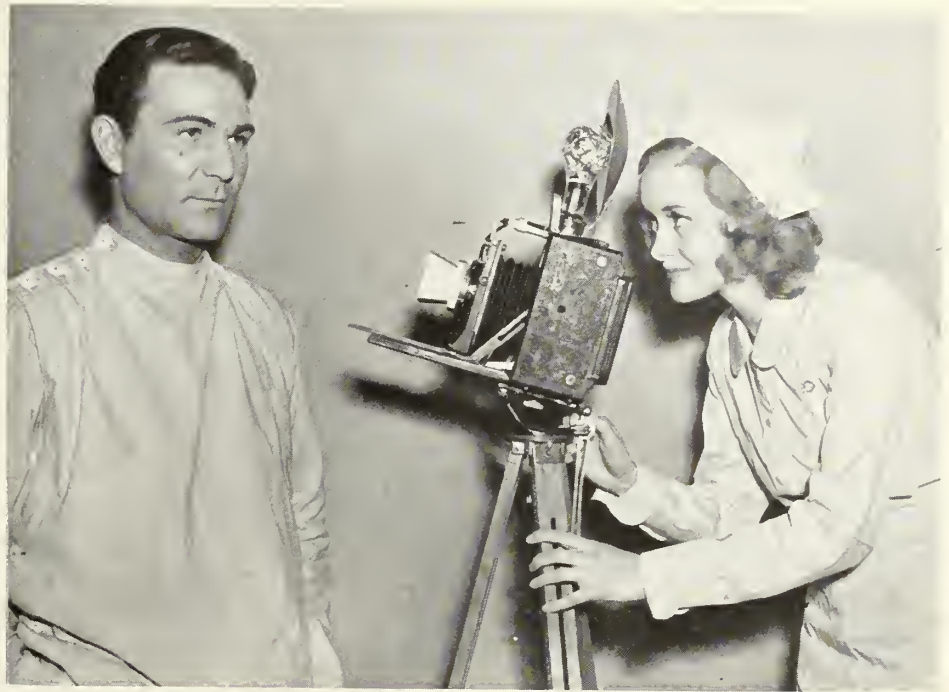
One of the biggest photographic jobs of its kind has been completed by the Federal Social Security Board, in recording on two 16mm films the names and social security account numbers of more than 37,000,000 applicants. The negatives also contain statements of age, names of parents, and other facts furnished in applying for social security account numbers.

The photographing was not begun until several months after the first applications for account numbers were received by the Board, but cameras are now abreast of numbers assigned and hereafter will be used only to keep pace with the incoming flow of applications.

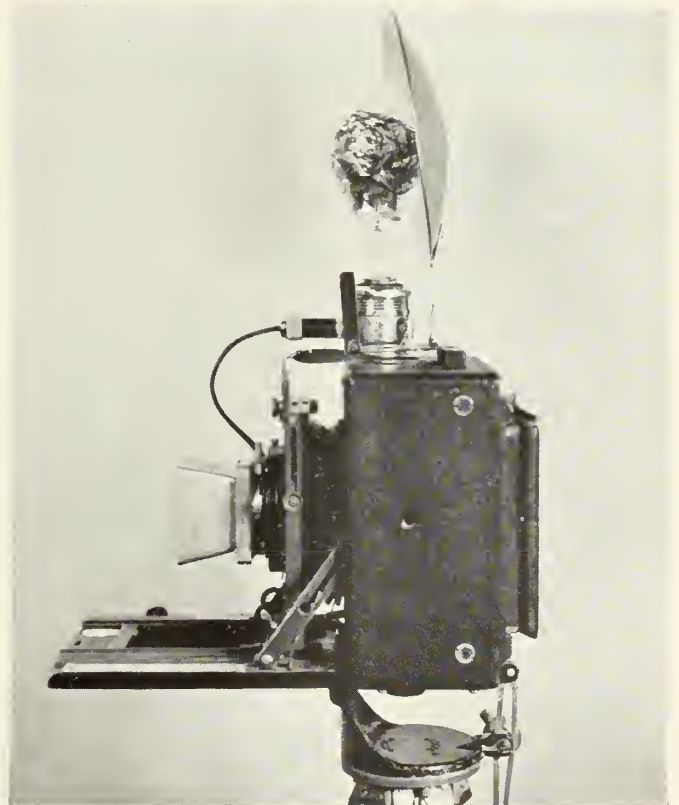
Utilizing projectors which enlarge the picture to about the size of the original application form, record-keeping-system operators are working with photographic enlargements instead of application cards. These applications are stored in 600 filing cabinets, occupying more than 5,000 square feet of floor space. The films occupy only 10 filing cabinets.

Permanent records thus are assured, since if a part of the accounting records should be destroyed by fire, either the cards or the films might be saved. In the event of destruction of both, there

AUTOMATIC FINDER for Speed Graphic photography, illustrated herewith, was designed by Fred Parrish, veteran member of Local 659, IATSE, who currently is shooting stills at Republic. The attachment on Parrish's 4x5 Speed Graphic enables him to shoot this type of picture with virtually candid camera speed and positive assurance of accurate focusing, plus capturing everything seen in the viewfinder, when it is moved out from the infinity position. A standard type 8x10 finder was used by Parrish, and underneath the finder is a moving cam, fastened to the front board. By careful and detailed tests Parrish finally completed a cam, which though very simple, procures exceedingly accurate photographic results. The finder set-up automatically compensates for parallax as the lens is moved in and out for focusing. Users of Graphic Type cameras are familiar with the problems encountered in getting absolutely accurate focus away from the infinity point. As the photographer moves in for closer shots he must guess in allowing for head room and other composition elements, as he does not get what is seen in the finder on his negative. Parrish states that



his device has never failed him in getting exactly what was seen on the ground glass. Shot of camera at right shows how finder is set (on top of camera) when lens is set at infinity;



and left, how pulling out the lens allows the finder to drop down. Parrish's gadget is essentially an adaptation to still photography of methods used in motion picture photography, and he

has applied for a patent on the automatic finder device. Above, Marian Marsh tries out Parrish's finder on Henry Wilcoxson, with whom she is featured in Republic's "Prison Nurse."

duction.

Using Kodabrom, a normally exposed negative will develop to full density and brilliance in 45 seconds, with particular richness and brilliance in its black tones. The paper also gets effective results from under-exposed prints, requiring three or more times the printing time.

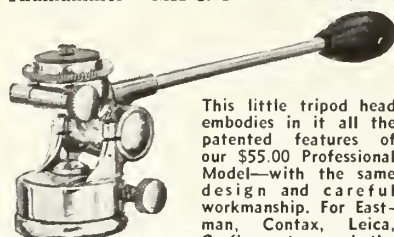
Another feature is stability of con-

trast, since its four degrees of contrast in Nos. 1, 2, 3 and 4 are equally spaced. The new paper comes in surface textures and stocks particularly suited to turning out prints intended for reproduction. The single weight comes in two grades: F, a glossy, white stock; and N, a smooth lustre, white stock; while the double weight comes in five grades: E, smooth semi-matte;

F, glossy, white; G, fine grain lustre, natural white; ;N, smooth lustre, white; and P, fine grain lustre, old ivory. List prices are the same as for Eastman's Illustrators' Special, Vitava Opal or P.M.C. Bromide.

Developer recommended for the new stock is D-72 with 1 to 2 dilutions, with time range from 45 seconds to 1½ minutes at 70° F.

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Sound

Mr. Stone Innovates

New Paramount director welds modern playback and pre-scoring technique into new shooting style that has possibilities.

There are a few shrewd students of motion picture production methods, who are familiar with the radical innovations introduced on the Paramount lot by Andrew Stone in his first directorial assignment, the recently completed "Stolen Heaven," who off the record are hazarding the prediction that if Stone's slants meet the test of commercial success, the motion picture industry is in for a truly sensational revision of many ideas on production technique.

Stone's "new idea" is so simple that on first statement it seems unimportant. He has merely taken the pre-scoring technique familiar to the entire industry (particularly for musical scenes) and applied it to an entire picture, with the added method of photographing the entire picture by stop-watch timing to fit the tempo set up in the musical arrangement that parallels the shooting script.

However, anyone who takes time out from Hollywood's beloved practice of rushing through everything as though they were running for the winning touchdown to study over the Stone idea, will amaze themselves with the innumerable ramifications it opens up.

Technicians familiar with recent improvements in playback recording and reproduction technique (Int. Photog., August, October, November, 1937) have speculated casually on the possibilities inherent in the new acetate discs and better playback reproduction as the solution of many production problems; both in freeing the camera for greater pictorial opportunities and in welding music more closely and logically into story emotional values. Stone has taken these ideas out of the speculative and translated them into action.

His first step was made in answer to a specific need. He wanted to pre-score a script and shoot the action to fit in with the score. Sound on film was out because of the obvious time that would be wasted in trying to find particular passages for retakes, and for other technical reasons. The new type discs were the best bet but still unsatisfactory, so Stone worked out a device for controlling playbacks to almost instantaneously repeat any desired part of the score.

As illustrated, Stone's remodelled

playback setup, which was designed and built on the Paramount lot to the director's ideas by Henry Fraker, a former Bell Telephone lab employee, now in the studio sound department, features a composition rubber arm which fits across the record from rim to spindle, and is marked with radial lines which line up with markings on the record, indicating various parts of the pre-scored music. This permits rapid selection of a particular passage for playback on the set by using sliding markers as guides in placing the needle. For protection, sufficient extra discs are cut to obviate any delays through breakage or wearing out of a disc.

The next important angle of Stone's invention (he already has applied for a patent) is instant control of the actual playback through a complicated arrangement. By pressing a button, Stone, while directing, can soften music so faint that it merely serves as a guide for players in their action; kill it entirely as dialogue is spoken for the recording devices on the set; or bring it up strong as a guide for group scenes.

Stone thus has a virtual robot assistant director and action prompter unsurpassed. And to the executive, director, writer and actor, who realizes the supreme importance of tempo to the motion picture, this opens up interesting possibilities.

Obviously, the most significant point about Stone's idea, is that if it clicks in picture making, something will be forced upon the industry that many people have been talking about but few ever expected to happen. That is that the director, writers, composers and production executive in charge will have to sit down together and cooperatively think out a story to its conclusion. They will have to deliver a completed script and score that will be much closer to the finished picture than we are getting today. And the bluffers, poseurs and buck-passers will have to make way for sincere, able and cooperative creative workers.

Of prime importance is the prospect that top production executives, who must assume the responsibility of improving the expenditure of huge sums on the shooting of scripts, will get a crisp, definite and specific completed

creative job upon which to base their decisions, instead of putting into production, as is so often the case, a story that they hope will jell on the set.

From one standpoint, Stone's ideas have passed the test of knocking theory against practical facts. Coming to Paramount from an astonishingly successful production for Grand National of "The Girl Said No" on a budget of \$70,000, Stone turned out his first picture for Paramount—unlike many theorists—with a minimum of temperamental pyrotechnics within budget and time limitations, yet without working in a maniacal frenzy of speed. Method replaced over-work as the efficiency factor.

Stone's playback methods work smoothly during actual production. Once rehearsed and set in their action by Stone's stop-watch timing to the score, working in conjunction with his special type of script, featured players and actors can go through their scenes with confidence and greater mental freedom to concentrate on characterization. Dialogue spoken on the set is recorded as under ordinary conditions; with Stone or an assistant cutting off the playback sound during speeches. The playback sound is recorded, but is cut out of the track recorded on the set, and the dialogue is dubbed in with the original master score.

Those who have studied the Stone technique, believe that instead of; as first might be assumed, restricting and hampering creative activity; it actually frees it by placing many routine matters under absolute control and promoting efficiency on the set.

Alert studio workers will be closely watching the Stone picture and also the new Sylvia Sidney-George Raft picture, "You and Me," on which Fritz Lang started direction for Paramount late last month. The famed Austrian director is using the pre-recording and playback technique 100 percent and other Paramount directors and producers are evincing considerable interest.

"While this reverses the usual procedure of having the composer suit his music to the completed scenes, the usual method is wrong," Lang insists. "That way the actors do not get the full benefit of the score. In this way they do. The music is constantly pacing their moods. Someone should have thought of it long ago."

Lang points out that in silent days a director could guide his players throughout a scene by speaking to them; nowadays he has to keep silent till the scene is over. Through "pre-scoring," however, he may have his ideas embodied in the music and then let the music direct the players.

In "You and Me," music is being given more importance than ever before in picture production. In a sense the com-

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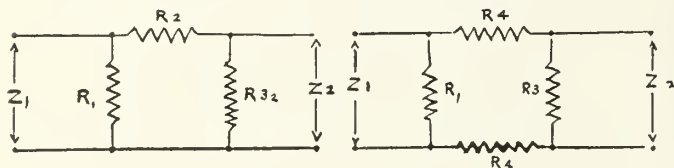
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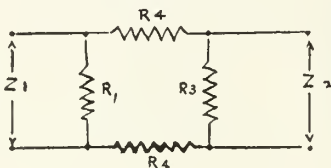
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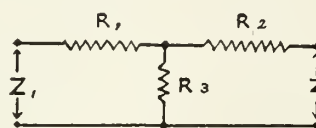
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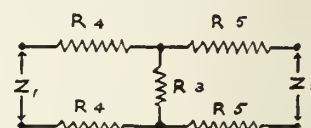
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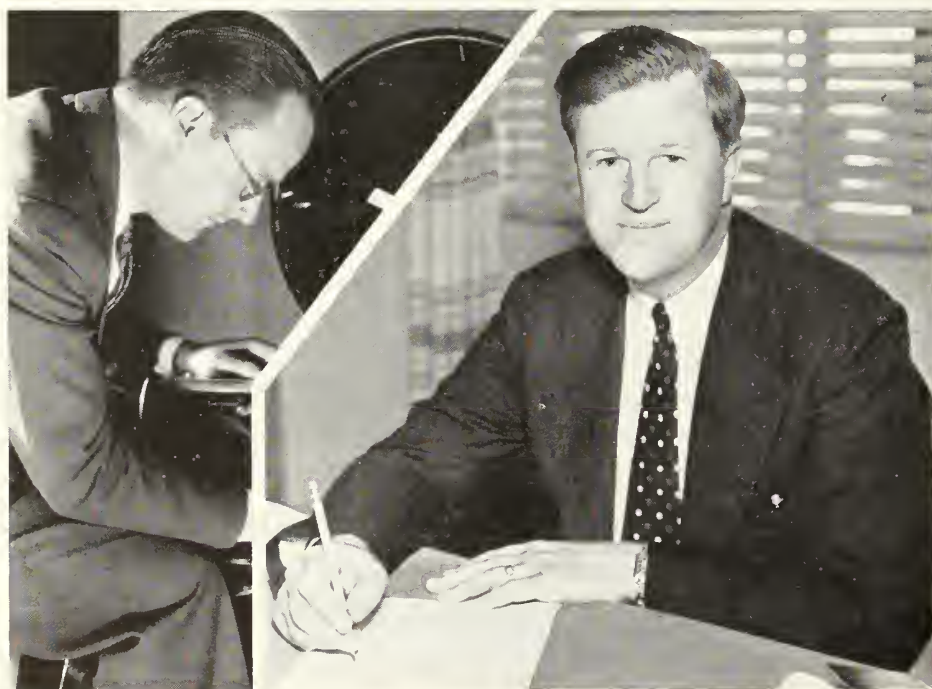
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 $Z_1 = 500 \text{ ohms}$
 $Z_2 = 250 \text{ ohms}$

Loss in D.B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4
6	.5012	∞	353	353	177
8	.3981	750	374	373	187
10	.3162	688	505	345	253
12	.2512	660	660	331	330
14	.1995	632	852	317	426
15	.1778	620	964	311	482
16	.1585	608	1090	305	545
18	.1259	587	1384	294	692
20	.1000	570	1752	285	876
25	.0562	540	3155	270.5	1578
30	.0316	522	5580	261	2790
40	.0100	507	17,700	254.5	8850

 $Z_1 = 500 \text{ ohms}$
 $Z_2 = 250 \text{ ohms}$

Loss in D.B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4	R_5
6	.5012	353	0	353	177	0
8	.3981	355	9	335	178	4.5
10	.3162	364	58	248	182	29
12	.2512	377	94	190	189	47
14	.1995	394	124	147	197	62
15	.1778	403	136	130	202	68
16	.1585	411	148	115	206	74
18	.1259	426	168	90	213	84
20	.1000	438	183	72	219	92
25	.0562	462	210	40.5	231	105
30	.0316	480	228	22.4	240	114
40	.0100	493	243	7.1	247	122



NEW PARAMOUNT SOUND CHIEF, Loren L. Ryder, at left, last month succeeded Franklin Hansen, right, who retired as head of Paramount's sound department. Hansen's department won several Academy sound awards in recent years. Ryder has been his assistant for some time. Hansen was presented with an inscribed cigaret case in token of the esteem in which he is held by fellow sound directors at a dinner in his honor at the Academy Research Council last month.

poser becomes the director's collaborator. Lang picked Kurt Weil, noted European stylist, whose original scoring of the stage play, "Johnny Johnson," attracted wide attention, for his pre-scoring assignment.

Although still a young man, Stone has been around Hollywood long enough to work in film exchanges, laboratories, and production offices. With the confidence of a man thoroughly familiar with his task, he works fast. Oscar Lau, property man on "Stolen Heaven," described him as "chained lighting." The cutters and photographers also were amazed. They made whispered comment on the number of feet of film shot in a day's time, or on the number of "set ups" before lunch.

Stone's big criticism of use of music in screen stories has been that it holds up the action. "When you see a person singing in the conventional screen musical," he explains, "it is the same as though on the stage they rang down the curtain in the midst of the dramatic action and brought a singer around in front for a solo. It's my personal theory that the audience, if it is interested in the story, and it certainly should be, objects to this business."

Stone seeks to overcome this by vari-



These shots from the still series photographed by Eddie Henderson, member of Local 659, IATSE, for Paramount's "Stolen Heaven," illustrate new production technique developed by Andrew Stone, featuring pre-scoring of the entire picture. Rehearsals and action were done to playbacks of a previously recorded score, which was timed with a new type script. Stone's invention to allow instant repetition of any particular part of the score—a special arm, with markings on the arm and on

the records—is shown top left. Top right and bottom strip are scenes from the picture. Olympe Bradna and Gene Raymond, stars of the film, are shown at center left, while in center, Art Fehman, playback director at Paramount, points out the setup of the playback equipment to allow for the Stone technique. Center right, Phil Boutelje, musical director, instructs Lewis Stone in piano technique, and in oval is seen directing a scene for tempo, using the playback method.

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ous methods. One is to have the prin-
cipal carry the song as long as it is
natural for him to do so in the story
and then turn the continuation of the
song over to other voices.

"Stolen Heaven," an original by the
director, follows box office thriller
formula: crooks, cops, and an exciting
chase; but in addition there is an in-
telligent attempt to introduce novelty
and quality, for this "cops and robbers"
story revolves about the playing of the
classic Liszt's "Liebestraum." The mu-
sic, along with that of Johann Strauss,
is not only heard in the background;
but it becomes a vital part of the dra-
matic action to the extent that if you
take away the music, then you take
away the story. Paramount executives
believe there has never before been a
similar fusion of music and drama in
a Hollywood motion picture.

Stone doesn't stop at pre-scoring and
mixing music and plot as innovations.
His shooting script gives the time re-
quired for action down to half-second
for many scenes. Other angles are mu-
sical dialogue by Olympe Bradna and
Gene Raymond. The first is unrhymed
dialogue, spoken to music, and the sec-
ond a series of images visually illustrat-
ing Liszt's Second Hungarian Rhapsody.

Another novelty is the use of a
"dancing camera." This required the
services of a musically trained "grip"
for the movement of the camera. He

was found in the person of Darryl
Turnmeyer, a "grip" on Paramount's
"back lot," who is a competent pianist
by avocation.

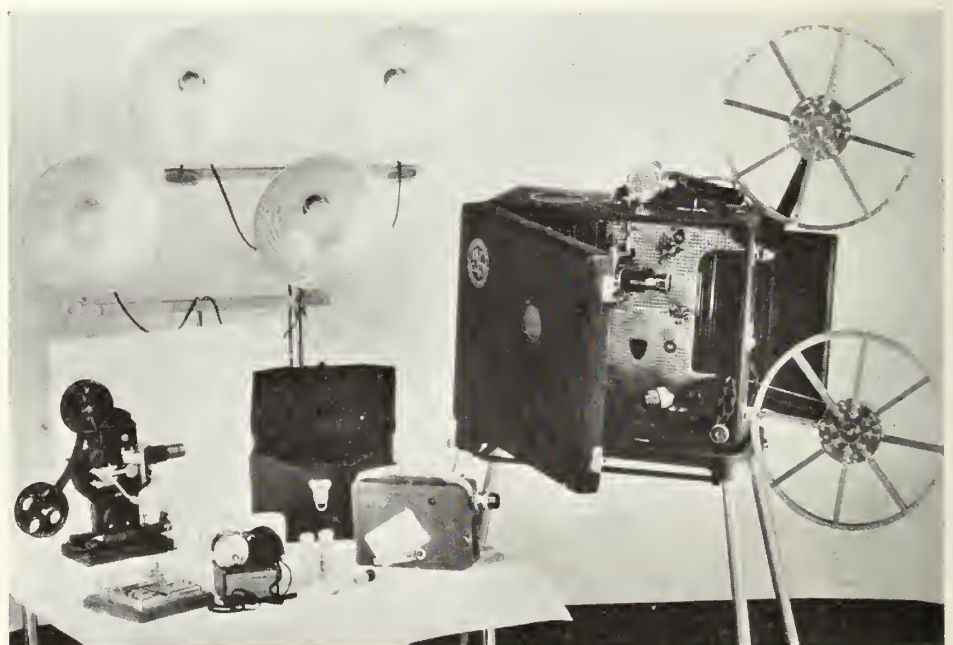
In the shooting of one scene, Turn-
meyer was called upon to change the
position of the camera seven times, and
each time on beat to a portion of a
Moskowski waltz danced through a
household by Bradna and Raymond.
Through this stunt Stone hopes to
heighten the audience sense of rhythm.

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in the planning and editing of such newsreels.

Projection

Academy Sessions

Research Council's projection sound standardization committee holding confabs with service chiefs.

Joseph B. Kleckner, president; Ed Kennedy, chief engineer, and Herbert Richards, promotion manager for Motiograph Company, were due in Hollywood early this month from Chicago for conference with the Academy Research Council's committee on standardization of theatre sound projection equipment characteristics.

The committee is meeting with representatives of various sound equipment companies for the purpose of more closely coordinating theatre sound equipment with studio sound recording practices; to acquaint these companies with the committee's program and to acquaint them with engineering ideas of the studio sound recording departments.

The advent of the several new sound equipment companies in the field has greatly increased responsibility of the

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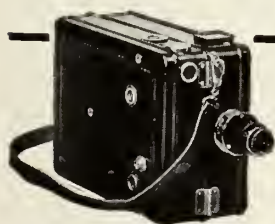
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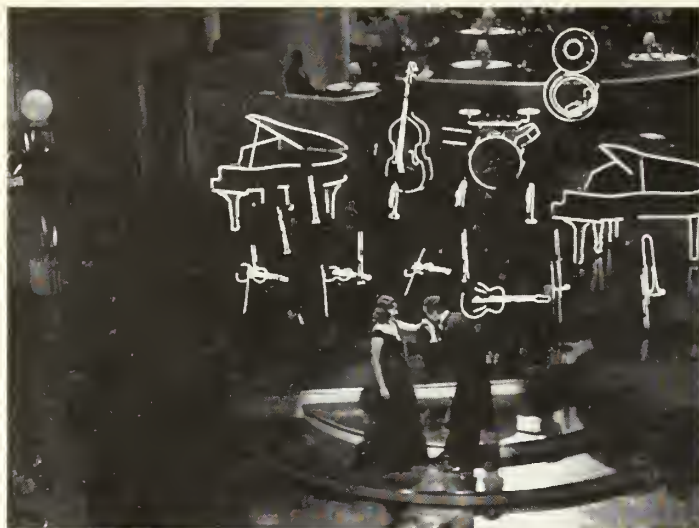
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UNIVERSAL NEWSREEL



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Pres. H. A. DeVry
and Norman Alley



NOVEL NEON EFFECT, illustrated above, was used at 20th Century-Fox to highlight the band in the Sonja Henie picture, "Happy Landing." Neon often is used for effective combinations

in lighting and stunt effects, particularly for musical pictures, and much of it is designed to studio specifications.

committee, which will in the near future issue a complete set of recommendations for theatre reproducing equipment.

F. C. Gilbert and G. L. Carrington, chief engineer and vice-president, respectively, of Altec Service Corporation,

which has taken over the ERPI service business, are coming to Hollywood to confer with the committee later this month, while Herbert Griffin, sales manager, and George Friedl, Jr., chief engineer for International Projector Corporation, were here during January.

struction will start late in March.

The building will measure 240 feet in length by 136 feet wide, and 66 feet in height, and will be completely air-conditioned. A tank will be constructed in the floor of the stage which will measure 90 by 90 and ten feet in depth for water scenes. A special portable floor section will cover the tank, so that when not in use, the tank will be covered with regular flooring. The air conditioning system is specially designed for the quick removal of fog or mist effects after "shooting" such scenes.

The stage will be the 30th sound stage to be erected on MGM's Lot 1. It will have a concrete floor instead of composition, and will be equipped with two hydraulic lifts specially designed for use during filming of special effects scenes.

The construction is under the supervision of William Koenig, studio manager, and John Tobin, plant superintendent. Arthur McArthur is the architect and Cyril P. Hubert is the structural engineer.

Lighting-Sets

Modern Still Light

Art Marion, veteran still photographer, to inaugurate series on still lighting with cooperation of George Teague.

So many changes and improvements in both the materials available and the technique of lighting stills have taken place in recent years, that virtually all recognized authoritative works on the subject are considerably out of date, except on basic fundamentals. The situation opens up so many possibilities for reporting and coordinating of technical and artistic data available today that *International Photographer* has received a number of suggestions that such information be gathered together in a series of well illustrated articles.

Such a series will be inaugurated in the April issue under the guidance of Art Marion, veteran still photographer, and long-time member of Local 659, IATSE. All illustrations for the series, which will cover all angles of lighting still pictures, will be made at the most modern still studio in Hollywood, recently opened by George Teague's or-

ganization. Teague's studio is completely equipped with all facilities, including his newly developed still projection background devices. All phases of shooting stills in black-and-white and color and with projection backgrounds will be covered in the series.

Cooperation on this new series by the majority of the lighting equipment and film manufacturers has been assured and we believe that it will make another important contribution to *International Photographer's* coverage of modern technical news angles.

Process

MGM's Effects Stage

New structure will feature indoor tank, hydraulic lifts and special air conditioning system.

Tentative plans and specifications for MGM's new special effects sound stage have been completed and actual con-

New Still Function

Still photographs used successfully at Universal for projection background shots in motion pictures.

A new function for the still photographer has been uncovered by George Teague, Hollywood's famed projection background and process expert, who also functions as head of Universal's process and special effects department. After considerable experimentation Teague has succeeded in using high grade still pictures for projection backgrounds for actual motion picture production. Teague recently developed modern equipment for pro-

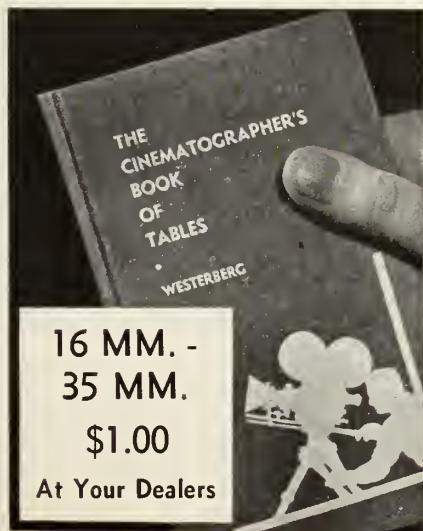
jection background work in still photography and now is getting a practical combination of the still technique with motion pictures.

First systematic testing of this technique under actual production conditions was accomplished with gratifying results on Universal's "Forbidden Valley," a low budget feature. Director Wyndham Gittens and Teague carefully planned in advance opportunities to use this type of effects in handling their script. Prime value of the still background naturally is restricted to scenes in which the background is static or for the adding of rare and unusual backgrounds that ordinarily would be obtainable by a motion picture location unit, into a picture. Slides for the still cinematography backgrounds are made from needle sharp 8x10 negatives photographed on location scenes by Universal still cameramen. Ray Jones, Roman Freulich, Ed Estabrook already have accumulated a collection of valuable stills for this purpose.

A particularly efficient grainless developer which allows for great enlargements in projection is being used for these stills and a laboratory technician has been specially assigned to concentrate on this work.

The value of this method in solving a situation was illustrated in the last Deanna Durbin picture, "Mad About Music," for which scenes from Norway were needed in a hurry and through the still system were worked into the picture with great speed and at considerable economy.

Another offshoot of the still background technique, which is expected to prove particularly valuable is use of pictures of set designs or famous locations to be recreated, projected to actual size, for the guidance of studio craftsmen, who previously have had to work from scale drawings and pictures.



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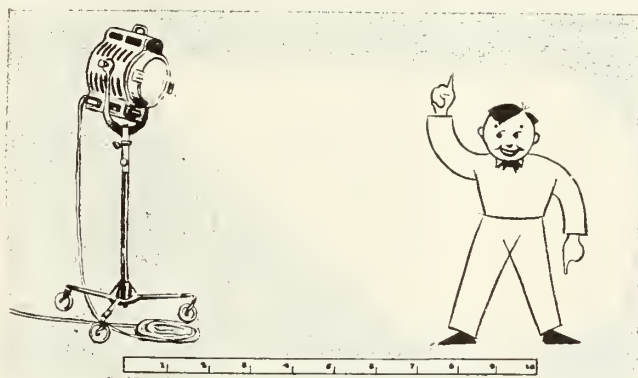
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Laboratory

Enhancement of entertainment values in feature pictures by the use of tints and tones in "sepia platinum" and other pastel shades is rapidly getting out of the experimental stage. John Nickolaus, MGM's lab chieftain, was the leading spirit in reviving this technique early last year. Used by the industry during silent picture days, but dropped with the coming of sound, big problem of handling toning is not the development of formulae or technique, but the building of adequate equipment to process release prints under modern conditions. This month MGM completes installation of a battery of new toning machines, while the Duplex organization is completing a toning setup for a major studio, using latest materials and methods.

It is because of this interest in ton-

ing that the current Laboratory Tables by International Photographer's contributing editor on chemistry matters, Donald K. Allison, is covering the accurate chemical analysis and control of this type of solution.

Toning Battery

MGM laboratory near completion of four new toning machines built in studio's shops from designs by A. G. Wise.

Installation of a battery of four toning machines at MGM is near completion in a new wing of the laboratory. When in operation they will have a capacity of 5500 feet of print per hour.

The new machines will tone in the original "sepia platinum" effect (Int. Photog., April, May, 1937) perfected by John M. Nickolaus, and also in pastel shades in tone and tint subsequently worked out by the laboratory chief. With non-corrosion chemical tanks, and other parts of a special alloy of non-corrosive steel, the machines, built in the MGM shops, were designed by A. G. Wise, laboratory engineer.

Construction of the machines involved many other laboratory details. Air is heated, filtered, and pumped into the drying boxes. A total of 22 air-conditioning units, which first water-wash incoming air, then filter it and dehumidify with air-mat filters, have been installed. These have a maximum capacity of 60,000 cubic feet per hour in air used directly on film, and a total of 90,000 cubic feet per hour in the entire laboratory. Anti-directional turbulation to eliminate "chemical flicker," a special development by Nickolaus, is used in the new machines.

So delicate is the tint process setup

The LABORATORY BOOK of TABLES

By D. K. Allison

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ANALYSIS OF IODINE BLEACH-MORDANT

Sample as delivered to laboratory: protect from light and air; analyze promptly.

IODINE	POTASSIUM IODIDE	pH	OXIDATION POTENTIAL
Take 50.0 ml. sample. Titrate with 0.10 N $\text{Na}_2\text{S}_2\text{O}_3$ to straw color; add 10 drops Sol'n G, continue titration with $\text{Na}_2\text{S}_2\text{O}_3$ to disappearance of blue color. Record as "Volume A".	Take 10.00 ml. sample; add one-fifth Vol. A of 0.10 N $\text{Na}_2\text{S}_2\text{O}_3$. Dilute to 200 ml., place in glass-stoppered flask. Titrate with 0.10 N AgNO_3 with vigorous shaking until the ppt. collects together and supernatant liquid is colorless. Add additional 10.0 ml. AgNO_3 ; record total volume AgNO_3 as "Volume B". Add 5 ml. Sol'n J, titrate with 0.10 N KSCN to pink color. Record volume KSCN as "Volume C".	Measure pH of 100 ml. sample, using the C&R glass electrode technic.	Measure oxidation potential, employing Allison pH Meter or Allison Electrometer; sat'd KCl-calomel half-cell, gold electrode. Convert observed E to hydrogen reference as follows:
Volume A		Report	$E_h = E_{\text{cal.}} + E_{\text{obs.}}$
×		as	$E_{\text{cal.}} = 0.250/20^\circ\text{C.}$
0.2537	Volume B—Volume A—Volume C	pH	Examples:
=	×		$E_{\text{obs.}} = +0.400 \text{ volt}$
grams I_2 per liter	1.66		$E_h = 0.250 + 0.400 = 0.650$
	=		$E_{\text{obs.}} = -0.150 \text{ volt}$
	grams KI per liter		$E_h = 0.250 - 0.150 = 0.100$
			$E_{\text{obs.}} = -0.440 \text{ volt}$
			$E_h = 0.250 - 0.440 = -0.190$

DIRECTIONS FOR THE PREPARATION OF SPECIAL SOLUTIONS AND REAGENTS FOR THE ANALYSIS OF IODINE BLEACH-MORDANT

0.10 N $\text{Na}_2\text{S}_2\text{O}_3$ —24.83 gms. $\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$ per liter.

0.10 N AgNO_3 —16.99 gms. AgNO_3 per liter.

0.10 N KSCN—10 gms. KSCN per liter; standardize against AgNO_3 .

Solution G—6 gms. soluble starch, titrated cold, made to 1 liter with boiling water; 10 gms. ZnSO_4 added.

Solution J—Cold saturated ferric ammonium sulphate, to which enough nitric acid has been added to cause disappearance of the brown coloration.



A. G. Wise, laboratory engineer, is seen at right examining the non-corrosive steel roller assembly of the new toning machines at MCM; and above he is looking over the solution

tanks, which are so controlled that temperature never varies more than one-tenth degree through a thermostatic device, known in lab slang as automatic "soup control."

that Carrier regulating equipment in the chemical solution circulation holds the temperature uniform to within one-tenth of one degree. Light regulation on the printing machines is regulated with equal uniformity, the motor generator sets providing current for the printing lights, being constant to a quarter of a volt.

Duplex Automatic

New machine built by Hollywood precision manufacturing organization meets modern toning demands.

The new automatic tinting and toning machine built by the Duplex precision

motion picture machinery manufacturing organization is capable of holding 2500 ft. of film on each side, for a total capacity of 5000 ft., and is along modern lines with entirely chemical resisting materials throughout. For smoothness of operation it has approximately 2000 ball bearings.

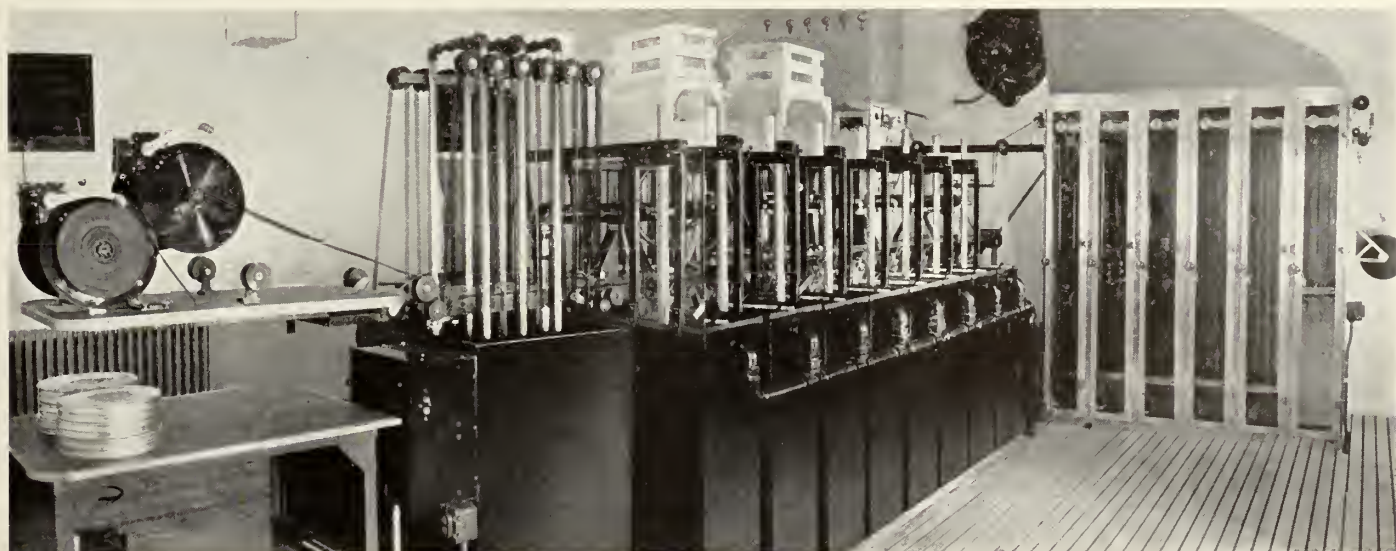
Among its features are: variable speed control, which allows a latitude from 18 ft. to 128 ft. per minute; adaptability to use for developing purposes if the room is darkened, and as a combined developing and tinting and toning machine; take up constructed so that it is capable of handling either reels or rolls of film.

Emphasis on resistance to chemical action is a major factor in this type of machinery and among the materials

used were bakelite, hard and pure gum rubber, pyrex glass, monel metal, stainless steel and special chromium plating in the drying compartments.

Many methods of tinting and toning film are used, but in most instances, and as followed in the Duplex design, the film travels steadily through a moistening bath and into a bleaching tank. It is then led into a wash tank before going into the tone. After another wash it is tinted and again washed before going into the drying compartments.

In the new Duplex machine the film is received from the developing rooms and is placed on a loading flange and attached to the leader. A second supply flange is also loaded with film so that no delay is ever occasioned in the continuous operation of the machine.



The neat, modernistic arrangement of the Duplex built toning machine, featuring many of the latest technical improvements in laboratory machine designing.

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OLD TIME NICKELODEON, shown above was operated during 1910 and 1911 by Floyd M. Billingsley and Tony Kornmann at Houston, Texas. Billingsley is well known to IA members today as International Vice President from the San Francisco Bay area; while Kornmann, member of Local 659, IATSE, now is engaged in the equipment brokerage business in Hollywood. A far cry from modern de luxe cine houses, the Billingsley-Kornmann emporium for the galloping tin types had a seating capacity of 90, which frequently was stretched to 150 with standing room. Usual admission was five cents to view half a reel of the primitive flickers, but occasionally the ante was boosted to ten cents and a song was added. In those days each reel was in two parts, in contrast to today's 2000-foot reels. Run off of the one-reel films and warbling to slides generally took about fifteen minutes, but when the box office was clicking merrily the boys used to speed up the show to twelve minutes.

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Close-ups

By ED GIBBONS

New and Vital

While the motion picture industry has been making technical strides of amazing proportions since sound dealt an entirely new hand all around in production technique, the creative end of picture making has been playing its cards pretty close to the vest of late. That is not to say that there have not been many valuable new story trends, new approaches to characterization, new slants on stories and new ideas in scripts and direction insofar as the old-line methods of pushing these twists through the production hopper is concerned.

But while technicians have been tossing microphones, recording devices, cameras, lights and other important gadgets into the ash-can in favor of better ones; writers have continued to write their scripts in the familiar scenaristic molds; directors, by and large, have been shooting traditional setups, sparsely interspersed with touches of montage, odd angles and novel effects; film editing, in particular, follows the straight and narrow of the familiar; and the increasingly important army of musical contributors still are puzzling as to why they are called in at the last minute to knock out in a few days a score for a picture they might have been working seriously and successfully on for weeks. Hollywood, in short, wears all the stigmata of its curiously persistent creative and intellectual inbreeding.

The one significant highlight is a more or less general realization that while sound is here to stay, the story must be told with the camera, although only a few seem to be excited enough to do much about it. A corollary realization touches the importance and entertainment value of musical backgrounds, a factor that brings with it as many production problems as it does entertainment benefits.

Under the circumstances, the news of any new and important contribution to action, rather than vague theorizing on these matters, is a heartening note. Consequently, there is scarcely an executive or creative worker in the industry, who can not benefit from the reading of the

story beginning on Page 20 of this issue of *International Photographer* about the activities of Paramount's new director, Andrew Stone, and a subsequent investigation of the significance of his directorial and production innovations. Here is a man who jumps right in with the technicians in an enthusiastic attempt to wring everything possible in a creative way out of their contributions to the picture making routine. Even if other executives and creators borrow merely Mr. Stone's example, a move in the right direction will have been made.

The New Argus

Charles A. Verschoor, progressive head of International Research Corporation, and his cabinet of modern minded assistants deserve all the encomiums they will receive if their new Model "C" Argus camera is as big a success as they expect. A preview flash of the new instrument convinces that this much-discussed and long-looked for \$25 version will sky-rocket to even greater success than the company's sensational initial model, which in two years has made the most astonishing hit in recent photographic marketing history.

The new camera is the result of much careful study and planning. It is an attempt to meet the needs and desires of the average photographic fan and it will have a resounding effect upon the entire popular photography market.

For years people have been asking: Why doesn't someone manufacture a strictly American made miniature camera with the important features and versatility demanded by the average user at prices within reason for the camera and its essential line of accessories? Many have been the explanations and evasions, but International Research is the first company to answer the question with action instead of words.

If Verschoor's organization can take all the bugs out of such a camera line at the price they announce they will be accomplishing one of the most progressive steps in recent photographic history, both for the photography fan and the American camera industry. For there is no question—using the sensational success of the original Argus as a premise—but that the new model will result in a wide revision of present practice. It will simultaneously result in the junking of many currently sold medium priced miniature cameras and

so-called miniatures that are neither fish, flesh nor fowl; and it also will stimulate a healthy competitive situation by virtually forcing other American firms to enter the same field.

If International Research turns out in their new model, a reasonably priced miniature camera to meet modern needs—a simply operated, sturdy and fool-proof instrument—they will deserve a hand not only from camera fans but also from their competitor manufacturers in this country. It's about time for the American industry to step out and really demonstrate what it can do. And International Research is making the first move.

Notes at Random

One of the inside topics of conversation in sound circles is the astonishingly successful results obtained with comparatively antiquated equipment by the United Artists sound department, and this group is being boomed for the Academy award this year . . . the Society of Motion Picture Engineers will hold its spring meeting in Washington, D. C., April 25-28 this year, while the fall session has been set for Detroit, with dates still to be determined . . . keen interest in color photography prompted Paramount to have ace cameramen form a class in color photography during production of "Her Jungle Love" . . . every first cameraman on the payroll was required to spend three or four days learning color angles from Ray Rennehan, veteran Technicolor expert.

Hollywood's famous American Legion fight stadium is the central spot of a picture for the first time in Republic's "Hollywood Stadium," which features Evelyn Venable, wife of veteran Local 659 member, Hal Mohr, and gives radio announcer Jimmy Wallington his first featured film role . . . we visited the Republic lot last month with Herbert Yates, the company's president, and noted an unusually fine spirit of cooperation in all departments . . . this independent concern seems headed for its best year in 1938 under Yates guidance . . . Harold Lloyd is reported planning to use the stereoscopic stunt, which has clicked so well in Pete Smith's shorts, for some hair-raising scenes in "Professor, Beware," his latest for Paramount.

Walt Disney's "Snow White" was photographed entirely through Bausch & Lomb lenses . . . Carl L. Bausch of the Rochester firm has been conferring with Disney on the improvement of his novel "multiplane camera" . . . installation of special equipment now permits Agfa Ansco to supply duplicates on reversible films in any length from their New York laboratory.

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eye-level finder system serves all eight lenses.

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International PHOTOGRAPHER

Vol. 10

A JOURNAL OF PHOTOGRAPHY PICTURE ARTS AND CRAFTS

Hollywood California

No. 2



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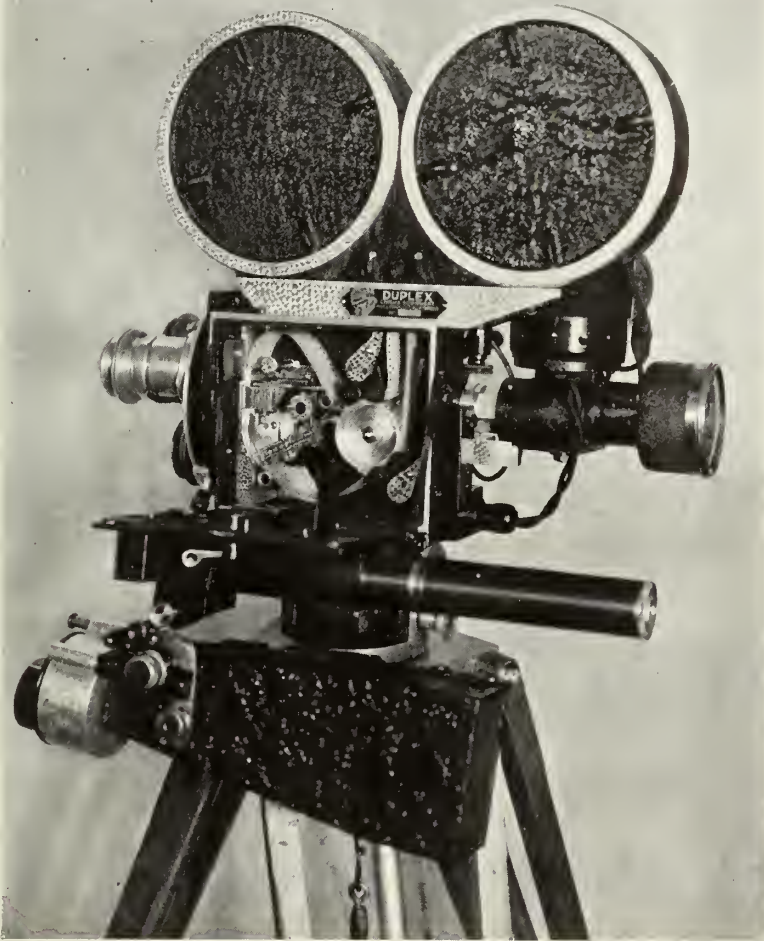
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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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J. N. A. HAWKINS.

Vol. X

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ON THE COVER. This month's cover is an unusually effective job of engraving by the Brown-Caldwell Company, in securing a rich color effect with two color plates made from a black and white montage, created by Ernie Bachrach, RKO still chieftain, and member of Local 659, IATSE, especially for INTERNATIONAL PHOTOGRAPHER. The cover ties in with the interesting stories in this issue's Camera and Projection sections on the technical highlights of Walt Disney's "Snow White and the Seven Dwarfs."

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PROGRESS KEEPS THEM COMING

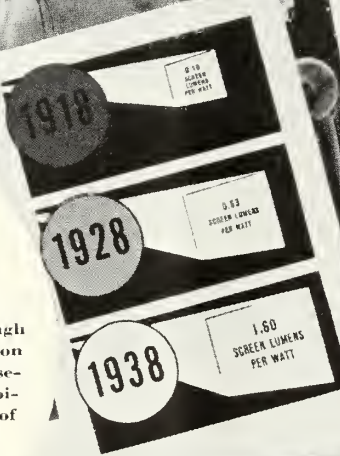


THEATER PATRONAGE IS THE YARDSTICK OF STUDIO SUCCESS

Stimulation of theater patronage through better projection and more comfortable vision is the aim of the current series of advertisements appearing monthly in leading exhibitors' journals. A recent advertisement of this series is here reproduced.

NATIONAL CARBON COMPANY, INC.

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High Intensity
PROJECTION
WITH NATIONAL SUPREX CARBONS



As in every other business, progress in the motion picture industry means more for the same money. The only way to hold patronage is by continuous improvement of the product you are selling.

Color is an example. Patrons will demand more and more of it. But good color projection means high intensity snow white light.

With High Intensity projection already installed in approximately one third of the country's leading motion picture houses, with a majority of the total seating capacity, patrons are accustomed to modern high grade projection. They expect it everywhere.

And why shouldn't they have it? Simplified High Intensity projection is not a luxury. It actually costs less per light unit on the screen than old style low intensity. Because this is so, you can have two to three times as much light on the screen and cover its cost with one more admission per show. Write for new, free, illustrated booklet, "The Eternal Triangle in Picture Projection."

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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

Tradewinds

The new Duplex Super Camera, an adaptation of a Hugo Meyer Cine lens for miniature photography, the new Leica gun for telephoto photography and the Balsley & Phillips newly engineered system for adapting good silent projector equipment for 16 mm. sound, are featured in this month's TRADEWINDS news.

PRODUCT: Duplex Super Camera.

MANUFACTURER: Duplex Cinema Equipment Co., 4572 Santa Monica Blvd., Hollywood. (Morningside 14717).

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: The new Duplex Super Camera is an easy to operate, light weight camera which features a 220 degree shutter opening and eliminates the racking over to view image. Designed for professional production use in the studio and for commercial work where silence and perfectly steady negative is essential, it features pilot pins and pressure pads designed to insure sharpness and steadiness. Small and compact, easily operated, it is ideal for newsreel work, expeditions and commercial, aerial and location photography, and is particularly valuable for obtaining background shots for projection background work under adverse conditions. Direct focusing is accomplished by shifting a small lever which gives the operator a correct, right side up, magnified image; and the finder also give a right side up magnified picture. Entire gate assembly may be easily removed for cleaning; and the entire movement is lubricated from one point. A new type cam movement, which operates in oil, has been perfected so as to obtain a quick pull down by the double claw, thus allowing the pilot pins to remain in

position for a long exposure. The 220 degree shutter opening permits work under adverse lighting conditions; and in the studio eliminates some of the excessive lighting. The three-blade shutter is hand dissolving, and may be operated at will.

Some outstanding features of the new camera are:

1. Small size and light weight.
2. Strong and durable carrying the Duplex guarantee.
3. Accurately manufactured to the highest degree.
4. Easily threaded.
5. Ample room for Bi-Pack films. (2 negatives.)
6. Has Pilot Pins and pressure pad release.
7. Buckle switch and reset.
8. Door cannot close unless sprocket rollers pilot pins and gate are correct.
9. Footage counter and reset easily viewed.
10. Means of focusing without racking over or disturbing the lens position.
11. Magnified erect image view finder, and built in magnified erect image focusing telescope.
12. Revolving turret with locking mechanism

ism which accommodates three lens mounts.

13. Three-blade dissolving shutter with range from 0 degrees to 220 degrees.

14. Hand crank conveniently located.

15. Sun Shade arm directly attached to the camera rather than to the tripod.

16. Built in hand dissolve lever and dial showing shutter openings.

17. Ball bearings throughout.

18. Perfected automatic frictionless light trap mechanism.

19. Equipped with standard motor mounting which will adapt a gear reduction type motor or a direct drive motor.

20. Noiseless intermittent movement.

21. All parts accessible for rapid cleaning if necessary.

22. Camera movement completely lubricated from one point.

23. Magazines are ball bearing equipped throughout.

24. Magazine covers have built in lugs for easy removal.

25. Small spool in magazine take-up, and high speed movement.

SPECIFICATIONS:

Weight—Approximately 20 pounds with three lenses and view finder.

Dimensions—6¼ inches by 7 inches by 7½ inches.

Capacity—1000 ft., 400 ft., or 400 ft. Bi-Pack Magazines without belt changing available for 35mm. film.

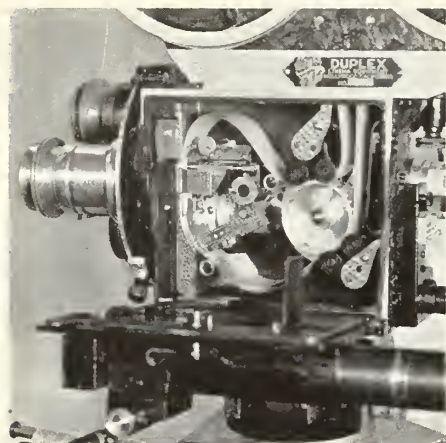
Shutter—Three blade 220 degree hand dissolve shutter.

Focusing—Focusing is accomplished without racking through a telescope upon ground glass,



Chalmers D. Sinkey, Universal Newsreel staff cameraman, well-known member of Local 659, IATSE, in Hollywood and Seattle, shown here with his Duplex Super Camera, says: "After giving the camera some four months of consistent workout, I am convinced that it is just 'what the doctor ordered' for news and feature men."





The Duplex camera with bi-pack threaded in. Note the buckle-switch and reset knob and pilot pins in registering position; while the double claw is just about to leave the perforations. This "overlap" of the movement assures the vital steadiness so indispensable in photographing scenes for projection background work. The magazine clamping screw is in position in this picture. It assures the operator a light proof mortised joint between camera and magazine.

which shows the aperture image right side up and magnified six times. The shifting of the prism into position makes this feature possible.

Aperture—The aperture plate is of hardened steel which is hard chromium plated. It is polished and lapped to a mirror finish to which emulsion will not adhere to scratch film.

Construction—All working parts are accurate to one ten-thousandth part of an inch.

Portability—As it is small and compact and very light in weight the Super Camera boasts of its extreme portability.

Built in features—A buckle switch and reset, and the focusing prisms are built into the camera. A Veeder footage counter, conveniently read, is also part of the furnished equipment.

Lens mounts—Lens mounts are carried in revolving turret which accommodates three lenses, and which may be revolved to any desired position. The mounts are especially designed for hard and accurate service. They are graduated in feet, and are also graduated for Bi-Pack film.

Tripod—Any standard tripod may be used with the Duplex Cameras, or our own light-weight, free-head tripod, which is sturdy and well built, proves ideal.

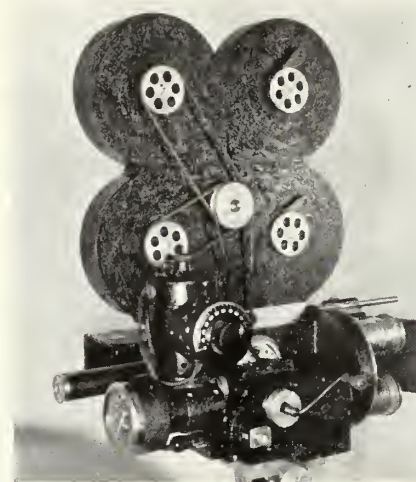
Carrying Cases—Carrying cases are made up to meet our customers requirements. Strong, serviceable, yet light and easy carrying cases are suggested.

Sun Shade and Filters—A Sunshade which is fastened to the extension arm of the camera itself allows the use of two inch filters in the holder provided. The simplicity and ease of operation of this system is unsurpassed.

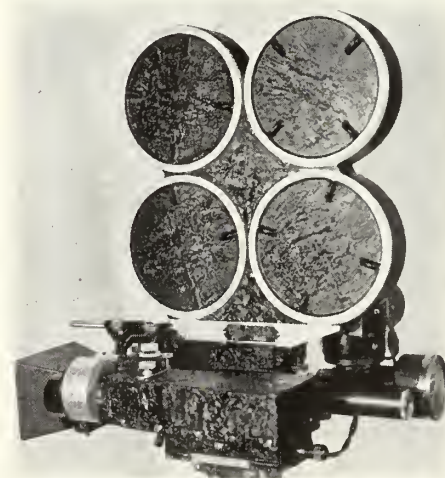
Duplex magazines are constructed of cast aluminum alloy with ball bearings throughout, and have capacities of 4000 feet, 1000 feet and 400 feet of Bi-Pack film. A special frictionless light trap is incorporated which is automatic in operation. Loading is very simple and quickly accomplished. The base of the magazine forms a light proof mortised joint and is secured to the camera by a knurled clamping screw. The 1000 foot magazine weighs 10¼ pounds. The 400 foot magazine weighs 6 pounds. The Bi Pack Magazine weighs 11 pounds.

Duplex camera motors are designed to meet

the requirements of the Duplex Super Camera. They have standard snouts for mounting, and are fastened into position in a moment with no effort. Reliable in operation and with reserve power they fulfill all the Duplex expectations. Synchronous motors may be used, or: The 110 volt AC-DC motor, control, and tachometer unit weighs 11 pounds complete; the 12 volt DC motor, control and tachometer unit weighs 11 pounds complete, and both types fit into the connection at the rear



Above and below are views of the Duplex camera with 400 ft. bi-pack magazines and wild motor unit. The top view shows the drive arrangement of the magazines and the adjustable brakes on the other spools. The hand dissolve lever and dial showing degrees of shutter opening from 0 to 220 is shown in the top view, located above the hand crank and just to the right of the wild motor control unit. The focusing telescope, which is visible in all the pictures on this page, is of a new design. With this type, no racking over of the camera, nor shifting of the gate, aperture or lens position, is necessary. The correct image is reflected by means of prisms, so that the cameraman sees the image right side up and magnified six times. A small lever on the camera door operates the device, which is the preferred method for focusing.



of the camera and extend up alongside the magazine.

PRICES: Duplex Super Camera, \$2500; 1000 foot magazine, \$125.00; 400 foot magazine, \$65.00; 400 foot Bi-Pack magazine, \$150.00; free head tripod, \$150.00; calibrated lens mounts (each) \$65.00; view finder, \$150.00; sunshade and filter holder, \$55.00; carrying

case for camera, \$27.50; carrying case for magazines, \$20.00; 110 volt AC-DC wild motor and tachometer, \$185.00; 12 volt DC wild motor and control, \$195.00. All prices f.o.b. factory and subject to change.

PRODUCT: Cine Trioplan Lens.

MANUFACTURER: Hugo Meyer & Co., 245 West 55th Street, New York, N. Y.

DISTRIBUTOR: Direct, dealers.

GENERAL DESCRIPTION: Adaptation of a Meyer cine lens to miniature photography aimed at securing needle-sharp negatives, the Cine Trioplan 105 mm. f:2.8 lens is fully corrected for astigmatism, coma, color and spherical aberration, and delivers crisp, brilliant and sharp negatives. The lens is precision mounted in an accurately made focusing mount that synchronizes with the autofocus range-finder of the Leica camera. In spite of its speed for focal length, the complete lens weighs only 10 ozs., due to duralumin construction of the focusing mount.

SPECIFICATIONS: Overall length, including sunshade furnished with lens: 4 15/16". Without sunshade: 4 2/16". Barrel diameter: 1 10/16".

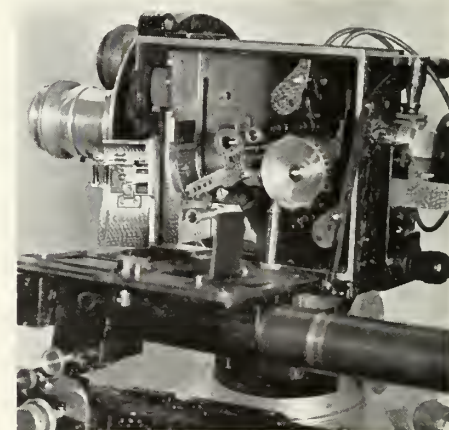
PRICES: 105 mm. Trioplan f:2.8: \$106; f:4.5: \$76.

PRODUCT: Leica Gun.

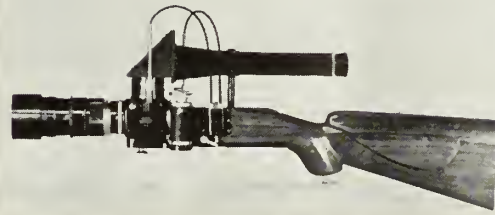
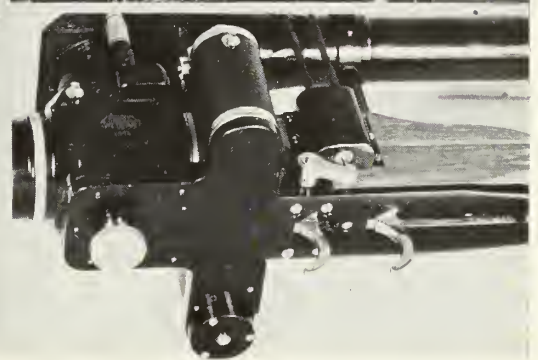
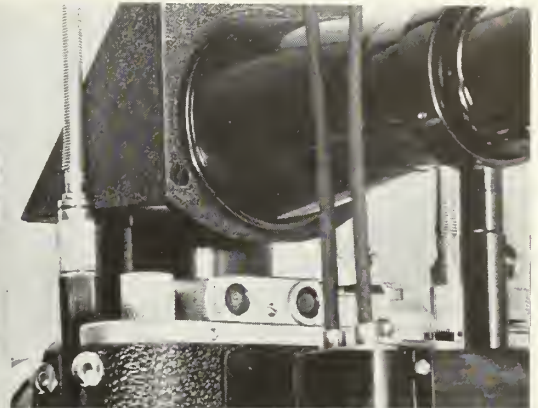
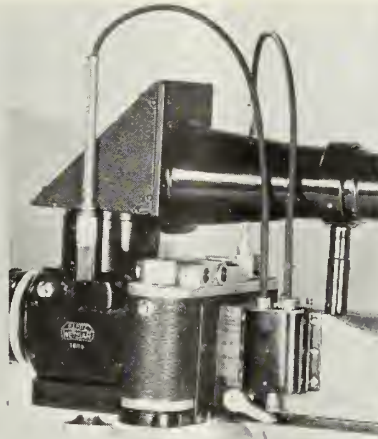
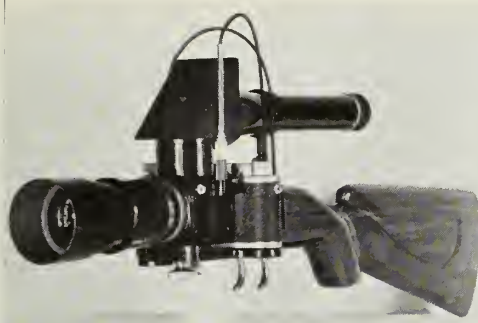
MANUFACTURER: E. Leitz, Wetzlar, Germany.

DISTRIBUTOR: E. Leitz, Inc., 730 Fifth Avenue, New York, N. Y.

GENERAL DESCRIPTION: Provides sportsman, naturalist and newsman with a compact outfit for using a long focus lens without the necessity of employing a tripod. As illustrated it is a completely designed unit, not just a camera mounted on a gun barrel. Focusing is accomplished on the ground glass of the mirror reflex housing, the image corrected, horizontally and vertically by the second mirror, being led back to the eye by means of the telescopic sight so that it is right side up and correct as to left to right. Lens is focused as usual by the lens barrel. Rifle stock has a pistol grip and two triggers. Forward trigger releases the shutter, making the exposure, while the rear trigger, connected with the camera take up by means of a ratchet, winds the shutter and brings a fresh section of film into position. This allows for rapid action as fast as it is possible to pull the triggers. Hands do not leave the natural position at any time, left hand being used for focusing, while right



In this view the gate assembly has been taken out by removing the thumbscrew. The aperture plate now may be easily cleaned, also the gate assembly, pilot pins, etc. This shot also shows the magazine removed, which is accomplished by loosening the clamping screws. The job of keeping this camera in perfectly clean condition and of changing magazines is rapidly and easily done.



About to be put on the market is this new Leica gun for telephoto photography, shown in long shots and closeups. Easily detachable for reloading, it features right side up focusing through a telescopic sight at top. Front trigger makes the exposure, while rear trigger winds shutter and moves film, allowing for rapid action photography. Lens is focused with left hand with the barrel as customary. The gun outfit weighs $8\frac{3}{4}$ lbs. Lens shown in the Leitz 200 mm. Telyt.

makes exposure and rewinds shutter. For reloading, the camera is easily dis-assembled by means of two knurled screws. When these are released, the entire assembly of lens, camera, reflex housing and viewfinder, comes off the gun stock in one unit.

SPECIFICATIONS: The gun weighs $8\frac{3}{4}$ pounds, and can be held easily at shoulder level. It makes use of the Leitz 200 mm. Telyt lens.

PRICE: Still to be determined.

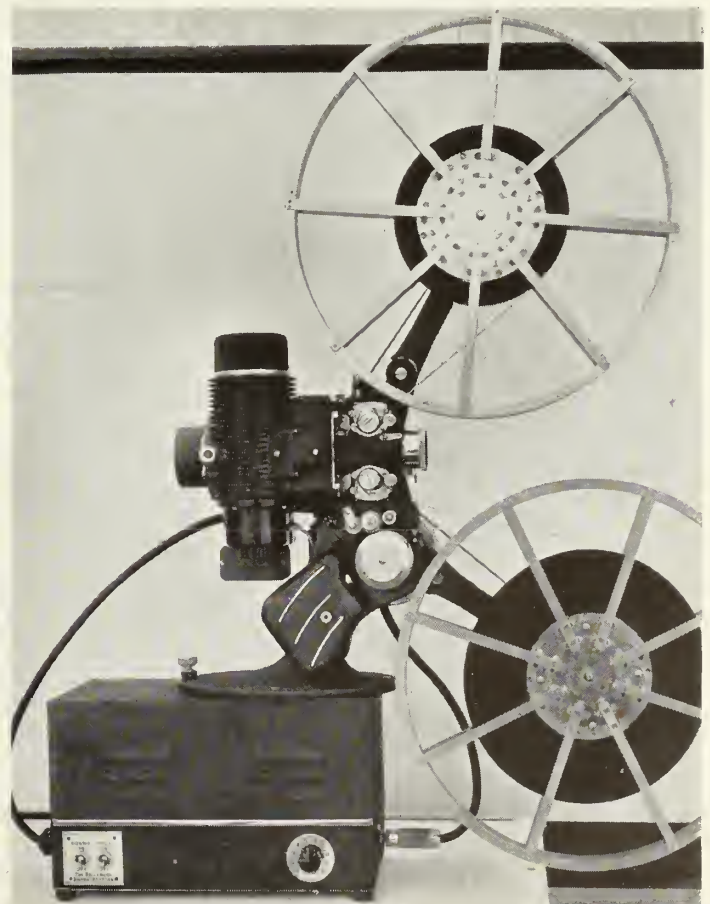
PRODUCT: Balsley & Phillips 16 mm. Sound System.

MANUFACTURER: Balsley & Phillips, 6206 Santa Monica Blvd., Hollywood, (Gladstone 5161).

DISTRIBUTOR: Direct.

GENERAL DESCRIPTION: This sound system was engineered and developed so that owners

of 16 mm. silent projection equipment would be able to salvage their investment in the silent equipment and convert it to up-to-date sound at a nominal cost. Addition of the sound system also includes a complete overhauling and reconditioning of the equipment with no extra charge, except replacement parts at cost. The Balsley & Phillips system is manufactured under Western Electric and A. T. & T. patents and is the only equipment



Right and left side views of an Ampro silent projection machine after it has been reconditioned and adapted to modern type

sound projection with the new Balsley & Phillips system, specially engineered to salvage good silent equipment for sound use.



of its type on the market today using pure direct current on the exciter lamp, giving the same type and quality of sound as obtained with standard theater projection equipment. A specially designed mercury dampened fly-wheel gives absolute constant speed at the sound take-off point. The amplifier is of special design, engineered by Balsley & Phillips, with sufficient undistorted power to play to audiences up to 2000 persons. The design provides that the film rolls freely at all times, having no more than 10 per cent additional strain over that of a silent projector, and gives the sound film approximately the same life as that run on silent equipment.

SPECIFICATIONS: Projector is shipped to Balsley & Phillips Hollywood plant and there completely reconditioned and sound system installed. Completed equipment has two carrying cases, with combined weight of less than 60 pounds. One case contains amplifier, specially designed speaker mounted permanently in the case, and 60 ft. of cord. This case also will accommodate a portable microphone and stand. Second case carries the projector, take-up reel and ample film for a showing. The reel arms are extended and the projector has a capacity of from 50 to 1600 ft. reels.

PRICE: Complete sound installation and re-conditioning, \$187.50. Any replacement parts will be charged at cost.

Camera

Gable Becomes Newsreeler

MGM star works with "News of the World" staff under IA permit to gather firsthand material for role in new picture.

The newsreel cameramen cover Florida fashion pageants, Washington politicians, flood disasters, riots and war atrocities with the same fundamental approach: "Get the news in the can and rush it to the boss." They are emotionally closer to the gentlemen of the press than to the artier photographic brethren of the show business. Competent technicians they must be, else they would not procure as daily routine so many noteworthy photographic records of events, yet they are essentially reportorially minded. They are trained to get to the meat and the punch of the story and get it on the film, and to get it regardless of the hazards.

The spectacular doings recently of several distinguished members of Local 659 in the newsreel field made front page history throughout the world and it was inevitable that the raw drama of such incidents soon would be shaped into motion picture form. MGM studio will feature Clark Gable, who is not a stranger to newsy roles, in such a feature, "Too Hot to Handle," and it was my pleasure to present the star with a working permit in our local so that he might get first-hand study under actual working conditions of the newsreelers' psychology and mannerisms to guide him in an accurate portrayal.

JOAN CRAWFORD, top-ranking MGM star, photographed in a strikingly lighted pose by George Hurrell, ace portraitist member of Local 659, IATSE, and a contributing editor to *INTERNATIONAL PHOTOGRAPHER*.



Clark Gable, who'll star in "Too Hot Too Handle," newsreel picture, for MGM, gets working permit in Local 659, so he can study for role under actual work conditions, from Herbert Aller, secretary of the International Alliance local, and managing editor of *International Photographer*.

In order to learn how the news of the day is captured for the screen, Gable is spending a number of days with Joe Hubbell, the Pacific Coast manager for News of the Day and cameramen Sam Greenwald and Roy Kluver. Under the guidance of veteran Hubbell, who was one of the first news-

reel cameramen in the business, and two of his proteges, Greenwald and Kluver, Gable is to have a real opportunity to work with newsreel men in action.

The writer had the opportunity of discussing with Gable his reaction to his part in the picture and what his opinion was of a newsreel cameraman's life. He welcomed the opportunity and thought the work of the newsreel cameraman was one of thrill and adventure, to be envied by many. Gable is seriously intent on doing a good deal of research in connection with this part and I feel sure that this portrayal on the screen should give us a true characterization of what the newsreel cameraman is, how he lives, what there is about his work that urges him to continue to be a one-man show, for that essentially is his status.

It is a certainty that Gable will conclude his experience with the newsreel boys with a much greater respect for their unusual combinations of initiative, tact, technical skill and ability to handle photography and people under varied and often, adverse conditions.

For the newsreelers handle every assignment as part of the daily routine and they must handle each one well. To them every assignment is an interesting new experience and any incident with human interest means news. The burden of deciding what should be shown on the screen and what must



Joe Hubbell, Pacific Coast manager for "News of the World," under whose direction Clark Gable will learn the tricks of the newsreel photographers daily routine.

stay on the cutting room floor is left to the editors.

This determination to get the news on film is best illustrated in the coverage of current war activities. Only a small part of the actual horrors of war, recorded by the camera, has been shown to theatre patrons, because of the restrictions imposed by good taste and fear of shock to more sensitive natures from the astounding scenes. Beginning with the Ethiopia-Italian warfare, followed by the Spanish civil war, and culminating in the terrific Sino-Japanese struggle, newsreelers were on the job.

Many of the scenes shown, though newsworthy and instructive, were of a shocking and repulsive nature, and there is no question but that they were obtained with great danger by the intrepid photographers. Much material also was eliminated because basic news-

reel policy calls for a rigid attempt to try and tell the straight news with no partiality of any sort.

Unquestionably, the most sensational news story of the newsreelers in recent years was the spectacular job done by Norman Alley of Universal and Eric Mayell of Fox-Movietone, when they were aboard the now world famous Panay. Disregarding their personal safety, concentrating on doing the job in hand well, they ably took pictures of an incident that shocked the world, illustrating how the Panay was bombed, fired upon, what occurred during the bombardment, the scramble to shore, how the victims fled for safety, tramping through the marshes and swamplands. During this trip the rolls of negative on which they were grinding assumed international importance.

These newsreelmen know no fear, or if they did, they didn't let it interfere

with their work. They had a job that must be done and I sincerely believe that most of them have the same attitude—adventure and thrills mean little to them—absorption in their work. They can find as much excitement in peaceful scenes, photographing sports events, competing for news scoops in safer fields. In fact, the Panay incident was marked by a great scoop being tossed aside because of professional loyalty and the mutual promise of two brother IA members.

Norman Alley's fine gesture in guarding the film of another newsreel company while in shipment from Shanghai to the U. S. A. was a splendid example of how a pact between two brother newsreel cameramen is carried out despite the fact that the men are competing against each other. When the bombardment commenced, neither Eric Mayell nor Norman Alley knew who would come out alive, but being fellow workers and loyal to each other, an understanding was made and when circumstances developed as they did, Alley carried out his promise in fine sportsmanship style.

In talking with Joe Rucker, who had just returned from Shanghai and is the same newsreeler who achieved world recognition with Byrd's first Antarctic Expedition, I put this question to him in straight forward fashion: "Joe is there anything more to being a newsreel cameraman that keeps you there besides the thrill and adventure?"

In his usual modest manner Joe smiled and said, "There is a certain satisfaction in being your own boss. Photography is my life work, but the newsreel cameraman has an opportunity to do more than just photograph a picture. He directs it. He arranges all the contacts. He interviews the people, discusses the phases to be photographed and even, in many instances, goes so far as to edit the entire picture photographed by him."

"You see, Herb," he said, "newsreel cameramen are in reality a one-man studio. Everyday there is something new on the horizon, different people, different countries. It's like reading a different book every day yet a book written to always hold your interest and leave you with an everlasting impression."

New Aerial Lens

Bausch & Lomb's Metrogon permits plane photographers to fly much lower and capture much more detail.

A new photographic lens, called the Metrogon, which enables a single photograph taken straight down from an airplane to show three times as much

area as has previously been possible from the same altitude, was demonstrated last month by engineers of the Bausch & Lomb Optical Co. at Rochester.

Previously it has been necessary to fly higher in order to cover more ground but haze and other factors introduced by high altitude have reduced sharpness and accuracy in aerial mapping. With the new Metrogon fitted to the camera, a plane can photograph three times as much ground without flying any higher or farther than has been necessary with the average lens previously used.

While lenses covering wide angles are not new, the combination of very wide angle with sharpness and freedom from distortion at the relatively high speed of f:6.3 is regarded as an optical achievement. The Metrogon covers 90° of field and has a focal length of 5¼".

So clear is the definition it gives that a photograph made from a height of one mile can show separate railroad ties anywhere within a two-mile circle beneath the plane. The fineness of detail which the new lens can record at the center of the picture is limited only by the graininess of plates and films.



GRAFLEX AWARD, shown above, a diamond studded watch charm, was inaugurated as an annual presentation for outstanding press photography by the Graflex Corporation last month. Announcement of the Graflex award is coincidental with the announcement of winners in Editor & Publisher's annual news picture contest, since the camera manufacturers decided to accept the winners of the trade journal contest as recipients of the honor. All five winners in this year's contest used Speed Graphic cameras, but the award is made entirely independent of camera equipment used. Of ten photographers receiving honorable mention, nine used either Graflex or Speed Graphic cameras. The award winners were: Samuel Shere of International News Photos, Carl Linde of Associated Press, Ernest Sisto of Times-Wide World, Arthur Saase of International News Photos, and Ralph Forney of the Ogden Standard-Examiner.



Standing under a warning sign that assumed new ominous significance recently in China are the Local 659 "Three Musketeers," whose newsreel work during the Sino-Japanese conflict made front page history and prompted MGM's new feature starring Clark Gable. Left to right: Joe Rucker of Paramount, Norman Alley of Universal, Eric Mayell of Fox-Movietone.

Marshall on Color Air Feature

Ace aerial photographer assigned to William Wellman's Paramount epic in Technicolor, "Men with Wings."

Charles A. Marshall, ace Hollywood air photographer, now is with Paramount, shooting aerial sequences for the company's spectacular air epic in Technicolor, "Men with Wings," which William Wellman, who made the successful silent air film, "Wings," is directing. The picture is slated as one of the most important on Paramount's program.

Aerial photography in color for important productions is just being mas-

tered as the larger Technicolor camera presents a number of difficulties that the technicians are just surmounting. The first important air scene in a big picture in color was as recent as the sequence in Selznick International's "Nothing Sacred."

While making the first flight for the Paramount picture, Marshall had a special windshield designed to break the force of the slip-stream off the big

Technicolor camera, and it almost resulted in tragedy. The device worked well enough for what it was intended, in fact, too well. It disturbed the slip-stream to an extent that is set up a terrific flutter on the plane's tail surfaces.

To save himself and the pilot from disaster, to prevent the tail from virtually vibrating off the ship, and to make it possible for the pilot to control landing the ship, Marshall was forced to smash the shield out with his hands while the plane careened at a height of 5000 feet. Both men spent some uncomfortable moments until he broke it loose. Marshall received a badly lacerated hand.

Marshall was a pilot in the Army Air Service during the World War and handles a camera in the air with the

same technique and accuracy as the average top-flight cameraman does in a sound stage. He just finished considerable air work on MGM's "Test Pilot," during which it was necessary for him to work at a speed of 180 miles per hour 50 to 75 feet off the ground in shooting the very fast backgrounds for the thrilling air race sequence in this production. At that speed in an open cockpit ship working under the physical handicap of a 250 miles-per-hour slip-stream; it was with great difficulty that he obtained the backgrounds going around the Bendix Pylon where it was necessary for him to tilt the camera up in synchronized motion as pilot Paul Mantz banked up 60 to 90 degrees in rounding the pylons.

While Ray June, first cameraman, was doing the interiors and some air

shots, Marshall was in the air completing many sequences, working from Union Air Terminal, Metropolitan Airport, Santa Ana, San Diego, and March Field. MGM assigns Marshall to do practically all their air work. Numbered among his previous productions at that studio are: "Hell Divers," "West Point of the Air," "Night Flight," "Today We Live," "Hell Below," "Flying Fleet," and "Test Pilot."

New Kalart Clips

Synchronizer concern supplying new clip and improved protective packaging.

The Kalart Company has a new reflector clip now in production and are enclosing it without charge with their

The CINEMATOGRAPHER'S BOOK of TABLES

By Fred Westerberg

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MAZDA LAMPS FOR PORTABLE PROJECTORS

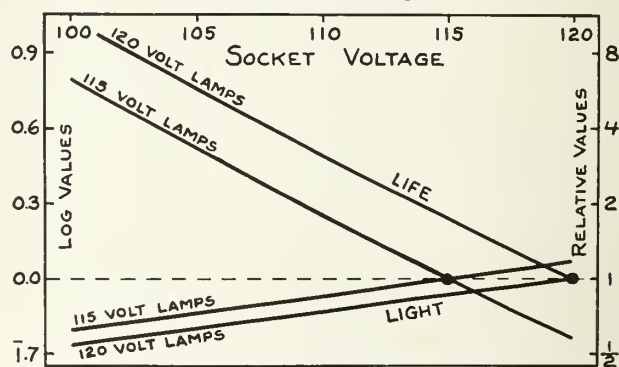
Rated Wattage	Type Bulb	Type Base	Filament Construction	Initial Output in Lumens	Average Rated Hours Life	Recommended Ventilation
For Use in 8 and 16 mm. Projectors						
50	T-8	S. C. Bay Cand.	Mono-plane	790	50	Natural
100	T-8	S. C. Bay Cand.	Mono-plane	1,870	50	Natural
200*	T-8	S. C. Bay Cand.	Mono-plane	4,700	25	Moderate forced
200	T-10	Medium Prefocus	Mono-plane	4,080	50	Natural
300	T-10	Medium Prefocus	Mono-plane	7,200	25	Moderate forced
For Use in 16 mm. Projectors						
500*	T-10	Medium Prefocus	Biplane	12,250	25	Forced
750*	T-10	Medium Prefocus	Biplane	19,500	25	Forced
1,000*	T-12	Medium Prefocus	Biplane	25,000	25	Forced
For Use in Portable 35 mm. Projectors						
500	T-20	Medium Prefocus	Mono-plane	12,750	50	Natural
750*	T-20	Medium Prefocus	Biplane	19,500	25	Moderate forced
1,000*	T-20	Medium Prefocus	Biplane	27,600	25	Forced
For Use in Semi-portable 35 mm. Projectors						
1,000	T-20	Mogul Prefocus	Mono-plane	27,000	50	Natural
1,000*	T-20	Mogul Prefocus	Biplane	27,600	25	Natural
1,500*	T-20	Mogul Bipost	Biplane	42,500	25	Moderate forced
2,100	T-24	Mogul Bipost	Biplane	58,000	50	Moderate forced

* 100 volt lamps recommended, for use with voltmeter and small variable resistance.

All lamps available at ratings of 100, 110, 115 and 120 volts except 2100 watt, T-24 lamp which is rated at 60 volts.

The above list contains only the most advanced types of lamps as recommended by The General Electric Co.

EFFECT OF CHANGE IN VOLTAGE MAZDA LAMPS



EFFECT OF CHANGE IN SOCKET VOLTAGE ON LIGHT, LIFE AND WATTAGE OF GAS-FILLED MAZDA LAMPS

115 VOLT LAMPS

Socket Voltage	Per Cent Light	Approx. Per Cent Life	Per Cent Watts
100	62.3	624	80.7
1	64.5	548	81.9
2	66.7	481	83.1
3	68.9	423	84.3
4	71.2	373	85.6
105	73.5	329	86.9
6	75.9	291	88.2
7	78.3	258	89.5
8	80.8	229	90.8
9	83.4	203	92.1
110	86.0	180	93.4
1	88.6	160	94.7
2	91.3	142	96.0
3	94.1	126	97.3
4	97.0	112	98.6
115	100.0	100	100.0
6	103.0	89	101.4
7	106.0	80	102.8
8	109.1	72	104.2
9	112.3	64	105.6
120	115.5	57	107.0

120 VOLT LAMPS

Socket Voltage	Per Cent Light	Approx. Per Cent Life	Per Cent Watts
100	54.0	1,090	75.5
1	55.9	956	76.7
2	57.8	839	77.9
3	59.7	737	79.1
4	61.6	649	80.3
105	63.6	573	81.5
6	65.7	507	82.7
7	67.9	449	83.9
8	70.1	398	85.1
9	72.3	353	86.3
110	74.5	313	87.5
1	76.8	278	88.7
2	79.2	247	89.9
3	81.6	220	91.1
4	84.1	196	92.3
115	86.7	175	93.5
6	89.3	156	94.8
7	91.9	139	96.1
8	94.5	124	97.4
9	97.2	111	98.7
120	100.0	100	100.0

Data by General Electric Co.

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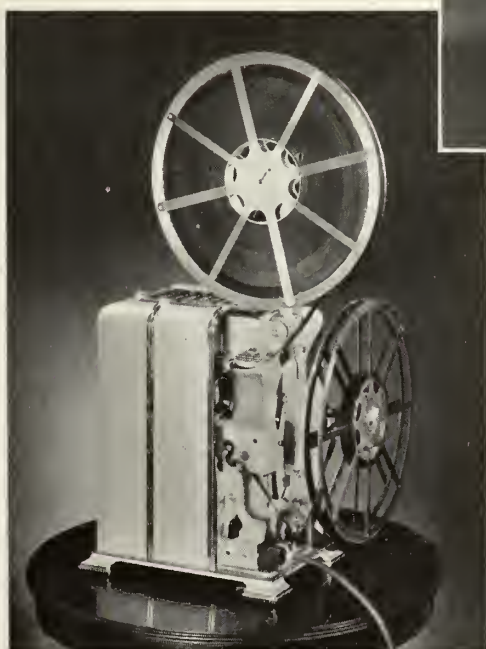
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Left—Compare the size of Sound Kodascope Special to that of the 1600-ft. reels. Compactness is but one of the many advantages of this entirely new-design 16 mm. sound projector.

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NEWLY PROMOTED to chief of Castle Films camera department is John A. LaPanne, veteran IATSE member, shown above in a Leica shot made by Jimmy Murray, member of Local 659, IATSE, who assisted LaPanne on production of advertising films for Sunkist and Southern Pacific during recent months. The Castle organization produces both home movies and commercial films and has branches throughout the country. Castle's new camera chief was impressed with the cooperation and efficiency of IATSE technicians in the west during his visit, and was particularly appreciative of the cooperation extended by Herbert Aller and members of Local 659.

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\$13.50 Micromatic Speed Flash, as well as with the \$11.25 Speed Flash. The company also has redesigned the container in which they send out the Micromatic Flashes. The new style is of sturdier construction and features partitions to keep the reflector, battery case and synchronizer from damage during transportation.

Another new Kalart development is

an arrangement with the Hughes-Owens Co., Ltd., of Montreal, distributors for Carl Zeiss, in Canada, to distribute and install the Kalart line in the Dominion. The company has branches in Winnipeg, Toronto and Ottawa. This setup will eliminate much red tape Canada camera-owners had to undergo in shipping their foreign made cameras in for installation of accessories.

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VETERAN HAIR STYLIST is Sylvia Wacker Berkeley, member of Local 724, IATSE, and a leader in the Motion Picture Hair Stylists Guild, shown above with Ann Dvorak. Miss Wacker is widely known in the studios for her own special process of applying liquid gold to dark hair to allow the photographer to bring out highlights. Made to a secret formula, the liquid gold is applied carefully with a small brush.

THE SOLUTION

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EASTMAN *Fine-Grain*

DUPLICATING FILMS



Horse Operas Please Whether Plain or Fancy



Perennial favorite and consistently a steady draw at the world's box-offices is the peculiarly American film product, the western, known also as the horse opera. These action pictures are typical of the feeling for dramatic punch that distinguishes the Hollywood product, and despite the lowly regard in which they are held by many of the cinema intelligentsia, they frequently afford fine moments of photographic and motion picture values, which might be and often are emulated in the more expensive pictures.

Some of the ablest photographers in the industry, and scores of assistant and second cameramen, who are trained and experienced in the particular problems of such productions, are engaged almost wholly in western and outdoor productions. And they play important roles in churning out the vehicles for such favorites with the western fans as Buck Jones, Gene Autry, Bill Boyd, Bob Steele, John Wayne, George O'Brien, Tom Keane, Dick Foran, Johnny Mack Brown, and other horse opera heroes.

Prominent among these members of Local 659 are Harry Neuman, Archie Stout, Gus Peterson, Allen G. Thompson, Russel Harlan, George Meehen, Paul Ivano and Jack Marta, while such able stillmen as Milt Gold, Earl Crowley, Don McKenzie and Warner Crosby are regularly turning out many beautiful and colorful shots of action scenes and beautiful exteriors.

The spirit of adventure that is an essential ingredient of the western pictures, however, has in the past few years, spread over into the more expensive productions and there generally is reflected among production executives a keen realization of the need for broad,



The colorful action shots in the top strip of Buck Jones, Columbia western star, hitting a stiff pace along a desert trail, were made with a Speed Graphic by Milt Gold from speeding camera car, as illustrated in picture at right. On opposite page is a spectacular action shot of Gene Autry, Republic's popular singing horse-opera hero, photographed by Warner Crosby. The picture below of Bill Boyd, who stars in Harry Sherman's "Hopalong Cassidy" series for Paramount release, was snapped by Don McKenzie; while the shot of Lou Gehrig, New York Yankee's famed first baseman and hero of many youngsters, who invaded the western lead ranks recently for Grand National, was made by Fred Morgan. In the picture with Gehrig is Allen I. Thompson, veteran member of Local 659, and one of the ace photographers of westerns. All the still photographs are by members of Local 659, IATSE.



romantic, sweeping stories, frequently of a historical nature as relief from the stager and more sophisticated type of drama.

Consequently, we find the spirit of the horse opera blazing lustily in big time productions, which on first glance might not seem to have so much in common, pictures such as "Marco Polo," "The Plainsman," "The Buccaneer," "Wells Fargo," "In Old Chicago," "Robin Hood," "Gold Is Where You Find It" and "Bengal Lancers."

This same feeling for the broadly romantic type of story with plenty of action and spectacular outdoor effects, also is reflected in current trends to aviation stories, and in another direction is taking up the U. S. Civil War again as a theme because of the tremendous public interest aroused by "Gone with the Wind."

The westerns, in other words, are not

only the bread-and-butter product of the independent producers, but their continued and persistent success in spite of frequently recurring predictions that "the day of the horse opera is about over," emphasizes that they typify a type of bold, exciting entertainment of which audiences will never tire, whether turned out on regular schedule by the producers who specialize in horse opera, or dressed up with fancy production values and more subtle story treatment as smashing spectacles.

Despite their broad popular appeal, however, much credit for the continued box-office success of the better western pictures is due to the producers, directors, writers and the many technician members of the International Alliance, who specialize in this field, to constantly improve their product and keep one step ahead of public demand.

HERBERT ALLER.

Disney Multiplane Camera

Technical details of new technique which solved problems of adapting cartoon production to feature length.

Probably no development in cinema camera practice recently has provoked as much discussion as the new multiplane camera with which Walt Disney's organization was able to overcome the handicaps of cartoon picture production satisfactorily for the first full-length cartoon feature, "Snow White and the Seven Dwarfs." The new technique for animation production with this camera combines precise mathematical control with much greater elasticity of action and photographic effects. Many tricky obstacles were surmounted by the Disney organization in devising a workable camera to fit the specifications they had set for themselves.

The following description of the Disney camera is technical enough to satisfy the demand of experts for information about this new technique, while still readily understandable by those with only average information on the photographic processes.

The Mechanical Construction

The camera crane itself consists of four vertical posts, and forms the framework to which the various units are movably attached. These four posts are maintained in proper relationship by means of castings located at the extremes of the posts. The posts are approximately eleven feet four inches in length and about four and one-half inches in diameter, and are hollow tubes. These columns are provided individually with racks extending their entire length.

The first element used is the camera carriage itself, which consists of a platform mounted within and around the

four vertical columns. This camera carriage is provided with four spur gears located in the extreme corners of the carriage. These engage the racks on the four columns, thus enabling the camera carriage to be raised and lowered on the four vertical columns by means of a mechanical arrangement of gears. The camera carriage is counter-weighted at its four corners with the actual counter-weights suspended within each of the hollow columns. Sheaves are provided at the top of each column, through which is passed the cable which connects the camera carriage with the counter-weight itself.

In the camera carriage is incorporated a platform on which the photographing camera is positioned. The camera platform is further mounted on dove-tails which permit a transverse movement of the platform. These dove-tails are in turn assembled to another set of dove-tails which permits a lateral movement of the platform. Between the camera platform and the first set of dove-tails is a flanged ring with roller-bearings, which permits the camera platform to be rotated through an arc of 360 degrees. This is designed so that the center of rotation of the platform is co-incident with the optical axis of the camera lens when the camera is in the photographing position. Every movement described is calibrated in terms which are correlated to the studio's particular production technique, so that requirements during actual photography may be anticipated and plotted with a high degree of accuracy, and by the same means it is possible, at any time, to repeat

and re-establish any given set of conditions.

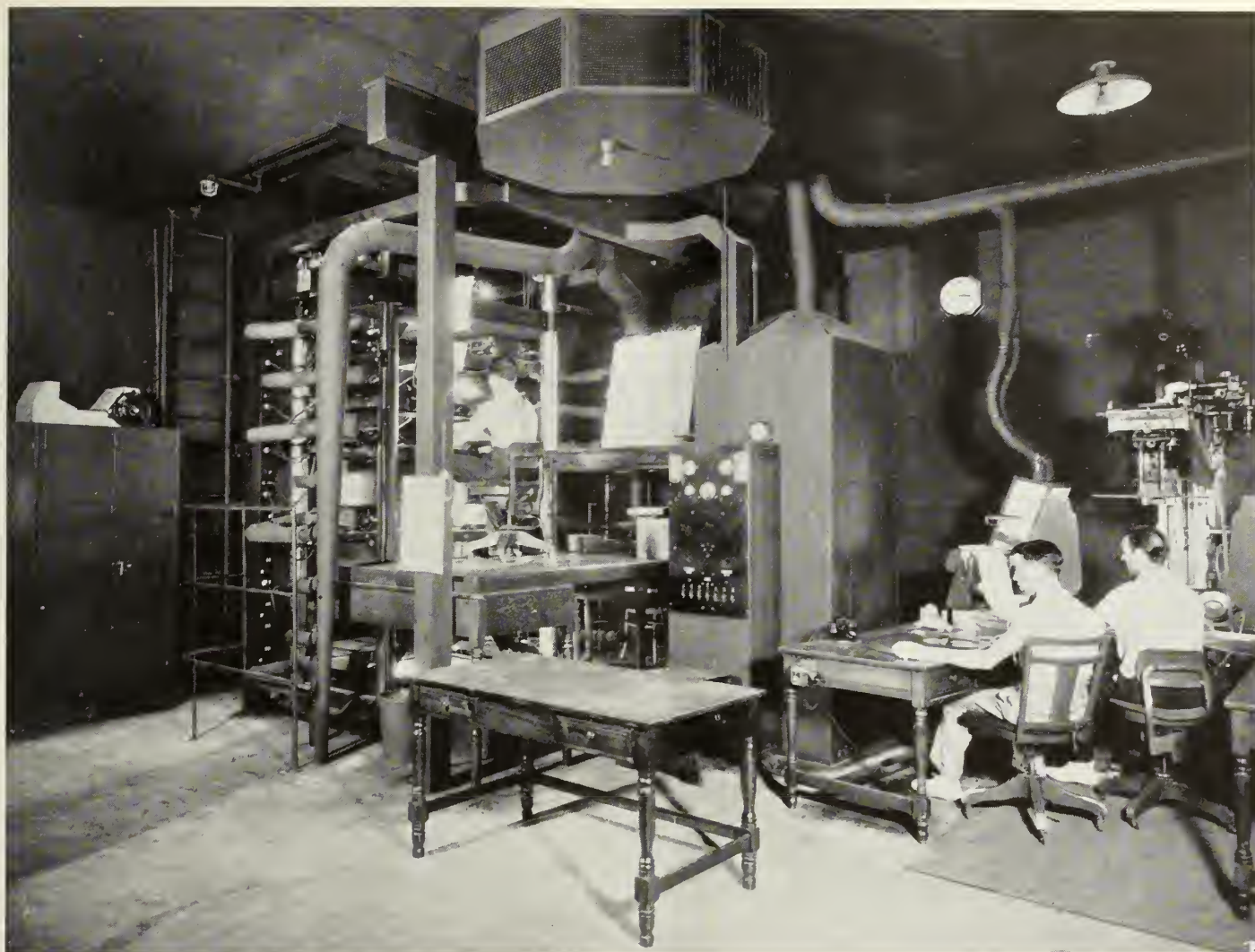
The camera platform is further provided with a synchronous driving motor, a new departure transitorque for producing variable speeds of exposure, a Hilliard clutch electrically operated to enable exposing of one frame of film at a time, and a set of reversing gears to enable driving the camera forward or backward. The platform is further equipped with a Selsyn Interlocked Motor, which is used in the drive of the control mechanism, which will be described later.

In addition to the camera carriage itself, several other elements may be installed between the four columns, and these elements carry the various components which go to make up the cartoon picture. There are two general classifications; one known as the action element planes, and the other as a background plane. These planes are so designed that they may be removed at will from the camera crane. They are also provided individually with spur gears which engage the vertical racks on the columns, thus making possible, through a suitable gear mechanism, to move the planes vertically to any desired vertical position on the four columns.

The action planes contain all the elements of a standard cartoon photographing table in that movable top and bottom peg bars are provided, as well as a movable background plate. This action plane is also provided with a platen which is operated by means of compressed air. The action planes also are equipped with their individual lighting equipment.

The background planes are somewhat simpler in construction in that they provide a means of holding sheets of glass which can be moved from east to west and in the same manner as described for the action planes, and also may be raised or lowered on the four vertical columns. The background planes also carry their own individual lighting equipment. As in the case of the camera carriage all the movable elements of both the action planes and the background planes are calibrated.

With this device has been accomplished an improvement in photographic technique in that normal background can be broken up into several elements, to-wit: A foreground element, a middle-ground element, and a background element. With this breakdown of the background into several elements, and due to the fact that they are separated and at different positions from the camera, there is a control of illumination on each element, which was not possible before. Also there is further control of the depth of focus of the photographing lens and, therefore, the studio can produce soft focus effects



Complicated equipment necessary for modern cartoon film production is clearly illustrated in this shot of the Walt Disney

multiplane camera, used for the production of the first feature length cartoon, "Snow White and the Seven Dwarfs."

which would be impossible under the standard system of photography, and would be extremely difficult to paint or to create by any artistic medium. Further, in the case of a perambulator shot, by causing the background to move concurrently with the camera carriage, is produced the effect of trucking up on the foreground elements and, while at the same time, maintaining the same perspective relationship of the background elements as would be the case in real life.

For example: Were we to have a character in the foreground, with a moon in the background, and it is our desire to truck up on the character, in the normal technique the moon would enlarge on the screen at the same rate as the character does. With this new camera we can maintain the character at a constant position on the camera crane, and as we move the camera carriage down to stimulate a truck up, we can move the moon background simultaneously with the camera, maintaining its distance to the camera constant while we reduce the distance between the camera and the character, thus creating a very normal and accurate condition.

The foregoing improvements are also possible on a still scene. With the use of a pan shot, we can produce a very marked and realistic three-dimensional effect. With our present day technique, when a pan shot is attempted, the foreground and the sky move at exactly the same rate of speed, which is contrary to all laws of nature. With this new camera set-up, it is possible, by breaking down the background into various elements, to cause the illusion of the foreground of the composition to move concurrently with the character and the intermediate and distant background elements to move at a very much slower speed, such speed being determined by the correct perspective relationship of the elements depicted by the artist.

Control Equipment

Due to the fact that in the normal operation of this camera, the services of one to six operators may be required, and their efforts must be coordinated, and the possibility of human error eliminated, there has been provided all the controlled indices with special illuminating lamps. While the operator is preparing his various controls for photography, these lamps per-

mit him to read the indications on the various control counters. When he has set all his controls, he pushes a button, conveniently located on his particular plane, which turns out these lights, making it impossible for him to read his counter settings. When he pushes this button, he trips a specially designed relay which cuts out the illumination of his indices and places the electrical circuit in such a condition that when all the planes have thus functioned, then, and only then, can the master operator trip the camera.

These special relays are connected by a series method so that all the relays from the various planes in operation must be closed before the master operator can energize the electrical mechanism which trips the camera. When the exposure is completed to the master operator's satisfaction, he pushes another button which restores all the planes simultaneously, so that the individual operators may proceed with the establishment of setting for the next exposure.

In view of the detailed manipulation for the multiplane technique, it has been found necessary to work with a master control sheet, which has on it

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the settings for each plane for each successive operation. It is made out in duplicate. The duplicate sheet is split up and the portion carrying the camera carriage instructions is given to the camera operator; the portion carrying the instructions covering plane "A" is given to the operator of plane "A," and so on, and the original master is placed on a master control board immediately in front of the master control operator.

In order to eliminate errors on the part of the master operator in knowing at just what exposure he is working, a Selsyn Interlocked Motor has been incorporated in the camera mechanism. The second Selsyn motor is incorporated in the master control board. The second motor operates a glass ruler device and indicates to the control operator just what exposure he is working on. In other words, when a new control sheet is placed on the board, the glass ruler is returned to the first exposure, the interlocking motors are energized and this master ruler is driven by the camera, regardless of whether the camera moves forward or backward, so that there is no opportunity, except in the case of electrical failure, for the master control operator to go wrong.

In view of the fact that the Disney studio is using projection type lamps, and for the Technicolor process it is required that they be burned over voltage, their life is necessarily short. To circumvent this condition, they have arranged an electrical circuit which introduces a resistance in the main line of the illumination source, and reduces the voltage on these lamps to around 85 to 90 volts during the time that changes and camera set-ups are being made. Immediately before the camera is ready to make the exposure, this resistance is cut out; the lamps are brought up to correct voltage; the exposure is made; and immediately following the exposure, the resistance is cut into the circuit again.

In order to further increase the life of the bulbs, as well as to reduce the heat element in the area of the camera, it was necessary to incorporate suction air flow at the back of the lamp house. This equipment was designed to give one change of air per second in the lamp house, and has been quite successful in increasing the useful life of the lamp, besides removing practically all heat conduction through the lamp house. It has the added advantage of keeping the area within the camera clear of dust and other foreign particles which are suspended in the air.

Light Measuring Device

In the development and design of the light sources used on this camera, it was necessary to develop special photometric equipment due to the acute angle of the light source to the photographed area, which averages about 27 degrees.

None of the commercial photometric devices were satisfactory. The device perfected for this particular function contained a caesium photo electric cell in a vacuum tube volt meter circuit. This photo cell was mounted so that its cathode looked at a small disc of heavily ground glass which was suspended about 5 inches below the photo cell itself. The glass disc is held in position by means of a piece of glass tubing about 2 inches in length, the glass disc being centered at the bottom of the glass tube. The glass tubing is suspended in a piece of brass tubing about 3 inches in length, interior of which is entirely opaqued and rendered non-reflecting.

The photo cell and tube are suspended by means of a double trunnion of a design similar to that used in the suspension of a ship's compass. The outer pair of trunnions in this device are established in a ring, and in this ring are set three posts so that the ground glass disc is suspended about one-quarter inch above the illuminated surface to be measured, and the three supporting legs are so positioned as not to cast any shadows on the ground glass disc. This device permits very accurate measurement of the perpendicular light which represents the useful photographic light. It was necessary to go to this device in order that the reflected surface remain absolutely horizontal at all times because a slight deviation from the level would cause a wide discrepancy in measurements. It is useful only in the setting of an over-all illumination, and is impractical for the establishment of light levels for the actual photography.

The View Finder

In view of the many elements that go to make up a single exposure on a camera of this kind, it was found necessary to be able to maintain a visual check on the progress of the work. The usual parallax camera finders were useless. It was necessary that the view finder coincide exactly with the optical axis of the photographing lens. This can be done, of course, by racking over a camera of the Mitchell type, but such was not practical. Therefore, a view finder was devised which followed in general idea a periscope. A reflecting prism was established immediately below the photographing lens and, through a series of other prisms, produced an image on ground glass as the camera lens would see it, at a remote point. The reflected prism immediately below the camera lens was arranged so as to move out of the optical path of the camera lens immediately prior to the actual exposure of the camera. This is the same principle as employed in the Graflex camera, and immediately upon the completion of the exposure, the prism returns into position.

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Projection

Cooperative Job Ahead

Projection practice must advance and modernize to handle properly latest type productions as typified by Walt Disney's "Snow White" feature.

Walt Disney's "Snow White and the Seven Dwarfs" is in the forefront of the campaign to improve the coordination between the technical facilities now available to the studios and the present state of affairs in projection practice. Everything possible has been done in the way of making this first feature length color cartoon the most modern and satisfying presentation that money and technical skill and application could produce, with special cooperation from the Technicolor company.

It was necessary to create special new equipment, including the multiplane camera (technical details of which are presented for the first time in the Camera Section of this issue of INTERNATIONAL PHOTOGRAPHER): new equipment and recording methods to reproduce sound that would be pleasing and natural; and softer lighting and more subdued coloring to prevent any possibility of eye strain and resultant fatigue in witnessing the picture.

What will happen to a production of this type when it reaches the theatres depends upon two factors: the equipment and the projectionists. We are certain that IATSE operators throughout the country will bend every sincere effort to accord this picture as close to its potentialities as they can; and we hope that they and the picture will benefit from the tips in this article.

However, as many projectionists will agree, particularly after a study of the accompanying data on the equipment and technique used at the Carthay Circle theatre in Los Angeles for "Snow White," there is a great preponderance of projection equipment throughout the country that is not modern enough to fully utilize the fullest values of the superior technical qualities now being put into our pictures in the studios.

This situation is a major proposition with the film industry today, to the extent that a coordinated campaign is being evolved to bring projection up to a par with modern sound recording. It is a program in which the studio technical leaders, the equipment manufacturers, the Academy Research

Council, the Society of Motion Picture Engineers and the International Alliance of Theatrical Stage Employees, whose members, especially in the theatres, are charged with so much of the actual responsibilities for projection quality; all are playing cooperative and effective parts.

This program calls for a hand-in-hand campaign to improve and modernize existing projection equipment and to widely disseminate the best and most authoritative information from the studios and the manufacturers. INTERNATIONAL PHOTOGRAPHER, as the official technical spokesman for the International Alliance in the studios, will join

Projection Tables

It is a pleasure to herald the full recovery from a serious pneumonia attack of INTERNATIONAL PHOTOGRAPHER's contributor on projection affairs, Paul R. Cramer, member of Local 150, IATSE, with his interesting stories on Walt Disney's "Snow White and the Seven Dwarfs" and the Disney multiplane camera in the current issue. With this timely resumption of projection news, INTERNATIONAL PHOTOGRAPHER plans an expansion of this department as outlined in Mr. Cramer's accompanying article. At the same time we are delighted to announce the early bow-in of another important regular contributor in William Comyns, well known to projectionists in Southern California as director of operators' local night schools, a national authority in the electrical field and a valued member of the staffs of the California state and Los Angeles city school boards. Mr. Comyns joins Fred Westerberg, D. K. Allison and J. N. A. Hawkins, authors of INTERNATIONAL PHOTOGRAPHER's current Cinematography, Laboratory and Sound tables, with a new series of practical and important tables for the projectionist. We feel that the signal success of Fred Westerberg's "Cinematographer's Book of Tables," soon to go into a second edition, and the interested reception accorded the Allison and Hawkins tables since their start several months ago, will be well-matched by Mr. Comyns' contribution. His tables, and those of Allison and Hawkins, will eventually be published in handy pocket form similar to the Westerberg book. Mr. Comyns also will contribute from time to time, pertinent articles on projection, sound and allied electrical angles of show business.

whole-heartedly in doing everything possible to further this constructive program, and we have assured all leaders on various fronts of the campaign that our space and assistance are readily available.

In addition to articles such as the following, a program of news coverage is being worked out so that projectionist readers will be informed of the new advances in equipment and technique as they are being tested and developed at the studios; and in co-operation with the leading manufacturers, most of whom currently are making important changes and improvements in their product, a series of well-illustrated articles will cover the hot news of developments in the equipment field.

Another welcome feature in this connection will be the addition to our regular contributors of William Comyns, whose authoritative voice on projection and electrical matters is well-known to Southern California members of the International Alliance.

The following information on "Snow White" was developed with the helpful cooperation of the Walt Disney and RKO-Radio staffs, Gerald Rackett of Technicolor and the projection staff of the Carthay Circle.

All the latest developments in sound were incorporated in the recording of "Snow White." In fact, the sound track represents a very faithful recording of the original orchestra. The characteristics of each instrument were preserved with remarkable fidelity.

The picture was recorded with the ultra-violet system. The sound stage was especially treated with the latest processes in acoustics which greatly improved the recorded quality of the music. The idea of a sound-proof stage was completely abandoned, and all acoustic absorption treatment removed from the walls and floors. This was done in order to be able to introduce reverberation in the recording of the music.

The stage was reconstructed with hardwood floors and with a solid hardwood back wall, splayed, in order to produce a minimum of echo and interference waves. The roof at the same end of the stage was also built up with hardwood paneling. The orchestra was placed immediately in front of this wall and under this part of the ceiling.

In the re-recording as many as eight sound tracks were recorded simultaneously. Much time and effort was spent with the laboratories to produce the finest sound quality in the prints used for this recording purpose.

In the actual recording, a first attempt was made to record about a 30-35 db volume range on the film without permitting any portion of it to be overloaded. This required that, for best reproduction, the fader setting in a

theatre be raised from 6 to 9 db above normal. With these conditions the dynamic range of the sound track produced excellent dramatic effects. However, it was realized that a great many theatres would hesitate to run a film of this character at a sufficiently high level. If the fader were raised 6 to 9 db to produce good sound level of the weaker passages, the smaller theatre equipments would not be able to take the fully modulated portions of the track without overloading the power amplifying system and possibly bringing about the destruction of the loud speaker units. In addition, raising the fader setting to this point also brought up the system noise, if present, to a disagreeable point.

The first recording of this picture was ideal from a dramatic point of view, but unfortunately, at least at the present time, it was not practical. Subsequently the picture was recorded with the volume range suppressed to about 20-25 db. Certain loud passages were allowed to overload about 3 db. This was a sacrifice to a slight degree on the over all sound quality and dynamic range, but necessary in order to service the maximum number of theatres with a minimum of objectionable features.

The volume range possible is definitely controlled by the inherent characteristics of the film plus the ever-present factors of dirt and system noise.

Considerable cooperation must be obtained from the projectionist in order to overcome these barriers with which studio sound technicians are faced. The ideal system of presenting a sound picture would be for the studios to record everything with a 100 per cent sound track. Cue sheets would then be supplied to the theatre, which would have specially trained operators sitting with a fader during the presentation of the show to raise and lower the volume in accordance with demands of the action on the screen as indicated by the cue sheet.

By such a system the ground noise factors would be negligible and if the cue sheets supplied by the studio were faithfully followed, a much finer presentation would result.

It is absolutely essential that before any theatre can render the present day sound recording satisfactorily they must have adequate amplifying equipment in order to handle the low frequency spectrum which gives vitality and feeling to music. This particular subject will be thoroughly discussed in subsequent issues of INTERNATIONAL PHOTOGRAPHER.

It must always be kept in mind that for true sound reproduction, the sound emanating from the loud speaker must approximate the sound levels that would be heard if the same orchestra which recorded the music were playing in the theatre. A 70-piece orchestra may be

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used in the recording but when it is reproduced in the theatre with insufficient amplifying capacity, the result is that the faders are turned down and the audience hears something which might as well have been recorded by a ten-piece band. It is heartbreaking to spend good money and time on the recording of a good orchestra and the subsequent processing of the film, and to obtain a gratifying result with the studio equipment, only to hear this same music later in a local theatre reproduced at such a low level that you have to strain to hear the music. One sometimes wonders what kind of showmanship can be responsible for such presentation.

The case of color in "Snow White" parallels that of sound. During the making of the picture many months were spent in the selection of colors. Much expense went into the production of backgrounds. Considerable effort was spent in photographing the subjects in order that the efforts of the artists could be faithfully reproduced on the screen. The Disney technicians feel that under proper projection conditions they have accomplished this end, but how many audiences will see the result is another question. The proper rendition of a colored subject requires high quality projection equipment and special care on the part of the operator.

Following are a few of the essentials which, if employed, will give the audience the correct rendition of the color:

1. Fully colored corrected projection lenses should be used in order to insure sharp focus and proper color rendition.
2. The screen should be evenly illuminated with not less than 11 foot candles.
3. The arc trim should be maintained constantly and accurately during the projection of a colored picture and never permitted to go on the blue side. The light on the screen should be clean and white at all times.
4. At no time should color be run on a grandeur screen unless the projection equipment is so arranged as to maintain a light level value of 11 foot candles.
5. Correct the focus of the lens system when changing over from a black and white reel to a colored reel.
6. The screen should be well and evenly illuminated for improved projection. The density of the average Technicolor prints is controlled to produce a satisfactory screen image when the light falling on the screen is approximately ten-foot candles (11 for "Snow White"). This illumination level can be checked by measuring the light falling on the screen with an instrument like the Weston Junior Photometer. This is done by holding the instrument just in front of the center of the screen with the light sensitive cell directed toward the projector, the latter running at normal speed and arc trim but without film. When this illumination falls on a clean, flat white screen, it results in a brightness of seven-and-one-half-foot lamberts.
7. The full beauty of Technicolor prints will be obtained if running houselights of strong color and high level of illumination are not lighted during projection. Illuminating fixtures whose lighting units are visible to any part of the audience detract from screen

interest. Managers should note that colored light should not be projected onto the screen or stage proscenium during the projection of a Technicolor picture. Chandeliers illuminated with other than very dim soft hues should not be lighted during the projection of a Technicolor picture. Chandeliers illuminated with any other than very dim soft hues should not be lighted during the projection of a Technicolor picture. All general lights other than aisle and exit lights, particularly chandeliers, domes, etc., under balconies which project over the orchestra floor, should be out for the best exhibition of Technicolor.

It may be said at times that the average audience does not notice the difference in these matters, but if the producers were to accept that psychology in the production of their pictures, namely, that "anything goes," our results would be very mediocre. It is definitely true that while audiences may not realize that the sound is poor or the color indifferent, if the sound is properly reproduced and the color properly projected, the dramatic effects are heightened to a remarkable degree and, therefore, the customer gets the most for his money. And in the final analysis, the movies are selling entertainment.

It was for this reason that when Disney contemplated the production of a feature length picture, his staff made a careful study of all the factors they could think of which might add to or detract from the over all result. They had been making color shorts for four years with a degree of success, and they felt that if they accepted the attitude that the customer would not know the difference, they could have produced "Snow White," using the technique they employed successfully in the shorts.

However, they considered such things as eye strain and the resultant fatigue which might come from the employment in an hour and a half feature of the photographic technique used on the shorts. They definitely decided that while this technique might not hurt the picture the improvement of the technique to produce a softer lighting and a more subdued coloring effect would remove any possibility of eye strain and resultant fatigue. They spent plenty of time and money in improving their technique, resulting in the development of the multiplane camera.

Under the old technique the characters and the backgrounds were photographed simultaneously on a single plane. This meant that the outlines of all the characters had to be sharp and clear as they were the principal points of interest. The result was that all the other elements of the scene, such as background and foreground objects, had to be reproduced with the same sharp definition.

To overcome these objections, they designed the multiplane camera which gave lighting control and enabled them

to photograph the characters in sharp focus and to control at will the definition of the other elements of the scene. In working out this problem they discovered that they had introduced a third element, a certain third dimension illusion which was inherent in the system employed for the production of definition control.

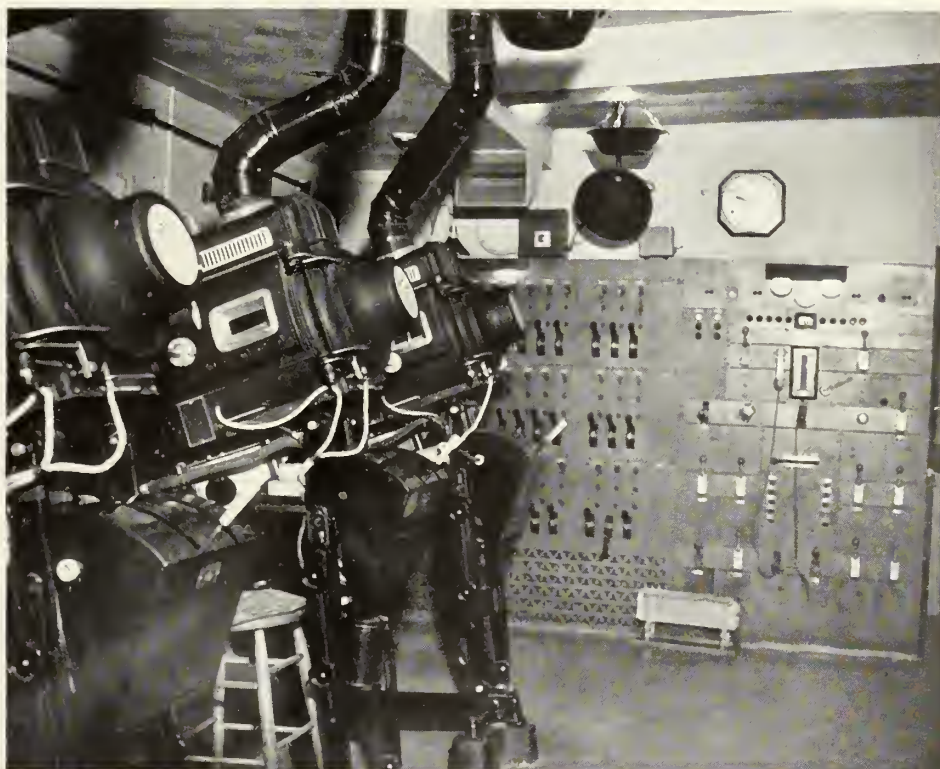
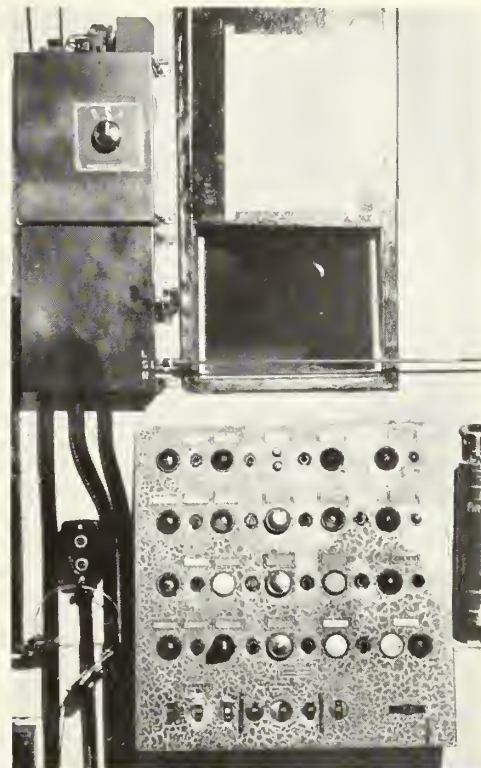
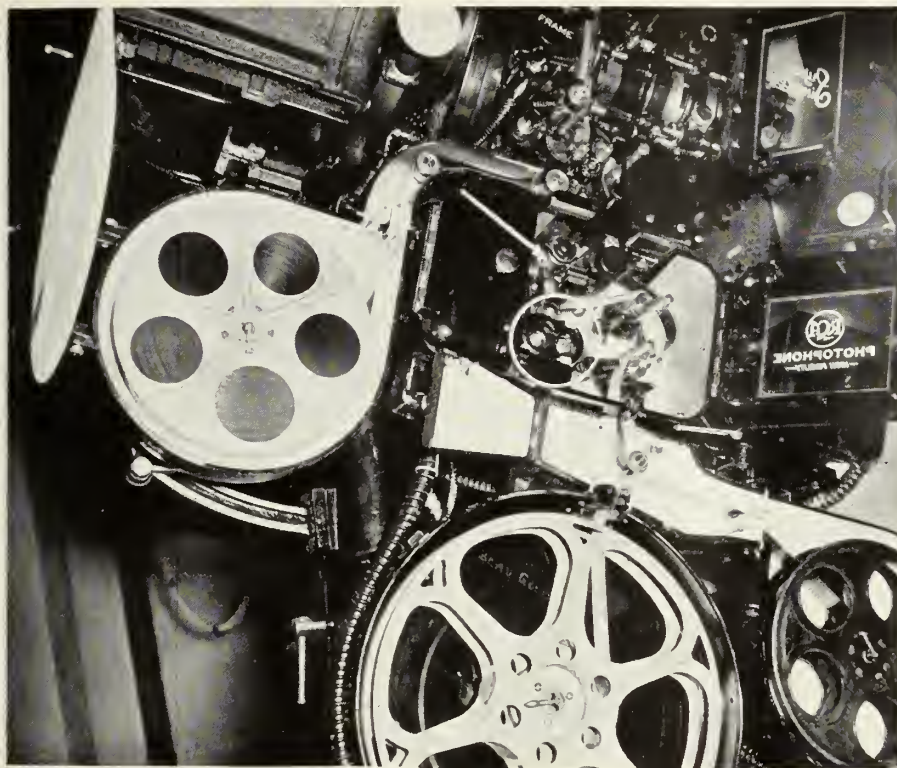
As is the case of all developments in the Disney studio, all possibilities were carefully explored and all steps tested before they were put into actual production. Before the multiplane technique was used in the feature it was applied to a Silly Symphony, "The Old Mill." Its success assured the realization of their efforts to improve the photographic technique in the feature.

For its premiere run at the Carthay Circle Theatre in Los Angeles, "Snow White and the Seven Dwarfs" was accorded the most careful handling in one of the most modern projection booths in the country. Features of the Circle booth are illustrated in the accompanying layout of pictures on Page 25.

The picture at top left shows a close-up on the Simplex machine with RCA rotary stabilizer sound head, with preview attachments. This head will produce either standard or push-pull type recordings, controlled by throwing the toggle switch, located in the lower left corner of the sound head (indicated by the white circle in the picture). For standard sound the switch position is up, and for push-pull down. In this same attachment is a potentiometer for balancing the output from both sides of the double P.E. cell. This is required for the finer reproduction of push-pull track.

Directly above this housing (indicated by the arrow) is the lens and prism assembly, which picks up the two beams of light passed by the push-pull track and directs them into the P.E. cell, located in the small round shield, adjacent to the lens and prism assembly. (Int. Photog., Dec., 1937, P. 25, Figs. 7-8-9.)

This photograph also shows how the two separate films are threaded in the machine. The motion picture film is threaded through the projector in the conventional manner, while the sound film comes from the magazine to the left of the sound head. Both these films come together at the hold back sprocket in the projector head. From there the sound film is threaded over the sound drum and pull down sprocket. It can be noted how the picture film is guided by rollers away from the rest of the mechanism in the sound head, until it comes together again with the sound film at the lower hold back sprocket. From there on the two films are seen traveling into their respective take-up magazines.



Four shots of the Carthay Circle theater projection equipment, with which Walt Disney's "Snow White and the Seven Dwarfs" was projected for its premiere run. This ultra-modern equip-

ment is fully described in the accompanying article by Paul R. Cramer, Local 150, IATSE.

It might be assumed, from the foregoing and the illustration, that to thread this type of dummy would be a lengthy and tedious process, but such is not the case. It has been found that with a little practice it is possible to thread up the complete set of two films in a little more time than for one film, and it is not nearly as complicated as it sounds.

The shot at top right on Page 25

shows the central and master control station in the projection room of the Carthay Circle Theatre. There are five stations, two to the right and two to the left of this station. To let you in on what all the gadgets are I will start from the top and work down. First, you will notice a hand knob on the uppermost square box, just to the left of the port hole fire shutter. This knob controls the master selector switch.

As you can see, it is marked RC for right center machine, RL for the right and left machines, and LC for the left and center machines. With this selector switch it is possible to run a picture on any one machine and the sound on any other machine; not that it has ever been necessary, but it is possible and quite practical. As will be noted, it is very handy for the projectionist at this station to change the sound,

while directly below this apparatus is the machine level, sometimes called the preset control.

With this type of control, as used with the RCA sound system, the projectionist can set the volume control on the amplifier panel board and cue the picture with the present control. This is practical only when your cues are within 20 db of normal. The preset control is set up in steps of 0-2½-5-7½-10 either plus or minus. However, it is quite simple for one to raise or lower the volume control with the remote control buttons just below and to the left of this preset control. Notice the buttons that say raise or lower. Just a touch of these buttons will raise or lower the volume on the main amplifier, giving the projectionist complete control of the volume at all times. This was used quite a bit for Samuel Goldwyn's "Hurricane."

The volume of each machine can be preset so that when the sound change over is made there is no last minute moving of the master volume control, and the sound change over can be made with less than one db volume increase or decrease.

Sound reproduction at the Carthay Circle Theatre is accomplished by the regular methods used by RCA in all their P.G. 92 installations with alterations to render the system more flexible. These alterations in no way alter the basic principles of the standard RCA installation but rather increases its efficiency in that it allows the projectionist to select the frequency peaks to be cut off at any desired point and gives him the further choice of increasing the power output of his system to the horns. Perhaps the reader would better understand the sound system at the Carthay Circle if we outline the layout and discuss the component parts as we come to them. First, however, it should be understood that it is not the purpose of this paper to give a technical description of the equipment. This has been covered many times. We will only concern ourselves with its arrangement and operation.

The sound on film is picked up by the regular RCA M.I. 1070 push-pull or standard sound heads and connected to the input of the voltage amplifier M.I. 1237, thence to the power amplifier, net work, horn switches and then to the horns back stage. The amplification channel is set up in duplicate which, of course, provides security against delays in the show. This feature has proven itself to be a very worthwhile investment and reflects credit on the engineering department of the operating company for its farsightedness in providing this item of safety.

In the shot at lower left on Page 25, the arrangement of the amplifier rack may be seen. Each track is a complete

sound channel. At the top may be seen the pilot lights which indicate the on or off position of the power supply units which are located elsewhere in the projection suite. Over the amplifier at the right are located the throwover switches which directs the output from any of the three projectors into either of the amplifier channels. Each channel has mounted directly under these switches the voltage amplifiers. Under the voltage amplifier on the rack on the left is mounted the radio input panel which permits the projectionist to play any broadcasted program over the theatre horns. This feature is never used, however, without the consent of the broadcast company and then only on special occasions such as a premiere when the opening program outside the theatre may be picked up from the air and played in the theatre. This panel is not in the rack on the right. Under this panel and opposite each other in each rack is the crossover network switches which enable the projectionist to alter the characteristics of the system so that the frequency response may be cut off at any predetermined point to best reproduce the subject being presented.

The next panel down on both racks contains the main A.C. switches for the amplifiers and the switches which allow for the connection of both power amplifiers to either voltage amplifier, thus utilizing the combined outputs of both power amplifiers. This will deliver one hundred and six watts as com-

pared with fifty-three watts with one power amplifier. It is seldom necessary in this theatre to use more than the fifty-three watts normally delivered from either channel. However, this switching arrangement is well worth while and has proven itself to be practical. The illustration gives an excellent view of the racks and by following the foregoing description the reader should be able to obtain a fairly clear picture of its operation.

The final picture in the layout, lower right Page 25, shows the projection room of the Carthay Circle Theatre from another angle. On the left are seen the three projection machines, while to the rear left is the largest preset type set of dimmer banks west of New York, that is located in the projection room. There are three rows of dimmers with fourteen dimmers in each row and three sets of preset switches on each dimmer. These dimmers are all run from remote control switches, one on each of the five control panels located on the front wall of the projection room, described in full in the account of the master control station illustrated at top on Page 25.

Just to the right of this dimmer bank is the general projection room switch-board; while to the right of that, at the extreme edge of the scene, is the door to the shop or work room, where also are located all of the fuses and relays of all the lighting circuits in the house.

PAUL R. CRAMER, Local 150, IATSE.

Patents

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,107,605—METHOD OF PRODUCING COLORED PHOTOGRAPHIC MATERIALS. *Bela Gaspar*, Brussels, Belgium. No drawing. Application August 9, 1934, Serial No. 739,136. In Germany August 10, 1933. 6 Claims. (Cl. 95-7)

A method of preparing films for color photography which comprises incorporating in the emulsion a lake forming dye-stuff and a salt which will react with said dye-stuff.

No. 2,107,623—MOTION PICTURE CAMERA DRIVE. *Joseph A. Ball*, Los Angeles, Calif., assignor to Technicolor Motion Picture Corp., Hollywood, Calif., a corporation of Maine. Original application August 20, 1931, Serial No. 558,193. Divided and application April 21, 1933, Serial No. 667,222. Divided and this application January 22, 1936, Serial No. 60,233. 5 Claims. (Cl. 88-16.4)

A camera for producing color separation negatives comprising a pair of gates and a pair of movements, all mounted on a supporting block.

No. 2,107,743—SOUND REPRODUCING AND RECORDING MECHANISM FOR THE FILMS OF MOTION PICTURE PROJECTORS. *Allen A. Shoup*, Chicago, Ill., assignor to Universal Stamping & Mfg. Co., Chicago, Ill., a corporation of Illinois. Application June 26, 1936, Serial No. 87,437. 15 Claims. (Cl. 179-100.3)

A sound projector having a film guide shoe mounted on the entrance side for guiding the film and means for keeping the shoe in contact with the film.

No. 2,108,073—COLOR FILM PACK. *Archibald H. MacDonald*, Detroit, Mich., assignor to The Coloray Corp., Detroit, Mich., a corporation of Michigan. Application Sept. 28, 1933, Serial No. 691,331. Renewed February 12, 1937. (6 Claims. (Cl. 95-2))

A film pack for color photography which comprises a commercial type film, an orthochromatic film and a panchromatic film with a cellulose filter between the orthochromatic and panchromatic films, the whole pack being enclosed in cellulose tissue.

No. 2,103,201—CINEMATOGRAPHIC CAMERA. *Charles F. Jones*, San Francisco, Calif., assignor to Tricolor, Inc., a corporation of California. Application June 1, 1935, Serial No. 24,514. 15 Claims. (Cl. 88-16.6)

A color camera employing a prism beam splitter and pull-down means for advancing both films simultaneously.

No. 2,108,284—METHOD OF PRODUCING PHOTOGRAPHIC EFFECTS AND FILMS THEREFOR. *Charles B. Dreyer*, Los Angeles, Calif., assignor to one-half to Henry F. Beoger, Los Angeles, Calif. Application April 2, 1934, Serial No. 718,559. 2 Claims. (Cl. 95-9)

A film for creating the effect of depth which comprises two emulsions on one side of the base but separated by a thin colored layer of diffusing material.

No. 2,108,337—FILM DRIVING MEANS. *Louis B. Hoffman*, Hollywood, Calif., assignor to Mitchell Camera Corp., West Hollywood, Calif., a corporation of Delaware. Application Nov. 2, 1936, Serial No. 108,780. 8 Claims. (Cl. 271-2.3)

Film driving means comprising a pair of drive sprockets, a mechanical vibration filter in the

driving connection of one of said sprockets and a film driven drum engaged by a film loop between said sprockets.

No. 2,108,602—PHOTOGRAPHIC COLOR-FORMING COMPOUNDS. *Leopold D. Mannes and Leopold Godowsky, Jr.*, Rochester, N. Y., assignors to Eastman Kodak Co., Rochester, N. Y., a corporation of New Jersey. No drawing. Application December 15, 1936, Serial No. 115,972. 11 Claims. (Cl. 95-88)

A color-forming photographic developer comprising an aromatic amino developing compound and an acetamide coupler compound with which the developing compound is capable of reacting on development.

No. 2,108,751—PHOTOGRAPHIC DEVICE. *Heinz Kuppenbender*, Dresden, Germany, assignor to Zeiss Aktiengesellschaft, Dresden, Germany. Application April 23, 1937, Serial No. 138,563. In Germany February 22, 1936. 13 Claims. (Cl. 95-44)

A range finder for cameras including means for producing at two spaced points images of an object and means for bringing the images into superposition and means for viewing said images.

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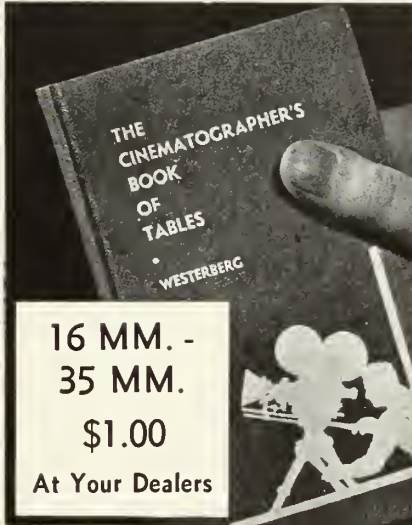
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Lighting-Sets

Super Light Sought

MGM Electrical Chief follows path of Stanford U. scientists in experiments with ultra power light sources.

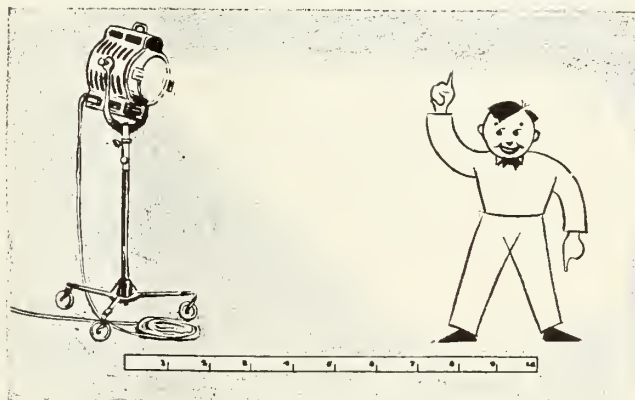
Spots of light so intense they rival the face of the sun, are the latest subjects for experiment by Hollywood's wizards of electricity. Intensive research into light higher in intensity than ever used before in any place outside a physics laboratory, is being conducted by Lou Kolb, chief electrical engineer at the Metro-Goldwyn-Mayer studios, in the hope of evolving a new light quality and speed for photography.

"High light from small points of origin," Kolb believes, "may mean intense light without a great deal of heat, thus making possible powerfully lit sets for color photography or for super-speed photography in interiors. Fast films so used are apt to lose photographic quality through not penetrating shadows, but with intense light, cool enough to be practical, speed plus absolute detail will be possible."

Kolb is experimenting with light sources which produce enormous amounts of light from a point of origin of very small area, such as a point hardly the size of a pinhead producing hundreds of candlepower. The studio experiments follow along the same lines as a series of research experiments that originated in the Stanford University

laboratories, and recently were widely publicized.

The idea is still in an experimental stage, says Kolb, and he cannot predict



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yet to what extent it will be practical in studio work.

"Scenes like the great courtroom in 'Marie Antoinette,'" he points out, "have to be so intensely lighted that the heat becomes oppressive, and doors have to be opened and stages ventilated at frequent intervals. The same is true in the opera house set of that picture. Similar intense lighting marked the Monterey fiesta sequence in 'The Girl of the Golden West.'"

"Hollywood has for years been seeking a light that would furnish actinic illumination with a minimum of heat. The idea of intense light from small origin points should solve this question, as much of the heat generated would be dissipated in the air about the source

of light, leaving comparatively cold rays where the light falls on the photographic object."

A high-intensity electric current, says Kolb, would be used but under rigid

control. Laboratory tests now are being made to determine whether the ideas developed in the university laboratory may be practically adapted for motion picture production.

Laboratory

Water Lab Table

Current Allison table covers system of chemical analysis to insure accurate control over water used in lab.

This month's Laboratory Table deals with the analysis of water. The im-

portance of obtaining and maintaining the supply of pure water to the processing laboratory is thoroughly realized by film laboratory superintendents and film technicians. The accompanying table with its system of chemical analysis, as prepared by D. K. Allison, INTERNA-

The LABORATORY BOOK of TABLES

By D. K. Allison

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ANALYSIS OF WATER

HARDNESS		pH	TOTAL ALKALINITY	CHLORIDE	TOTAL SOLIDS	To the residue from the total solids determination, add 1 ml. Soln H, warm. Add 10 ml. 0.10N KSCN. Make to 50.0 ml. in Nessler tube. Compare with standards prepared from Soln M.
Take two 50.0 ml. samples. Treat one according to Procedure 1; other by Procedure 2.		Determine pH, using Bio, or Industrial Model Allison pH Meter.	Take 50.0 ml. sample. Add 10 drops Methyl Orange Solution. Titrate with 0.02N H ₂ SO ₄ to first pink coloration.	Take solution from "total alkalinity" determination. Add 1 ml. Soln L. Titrate with 0.10 NAgNO ₃ to first pink coloration.	Evaporate 50.0 ml. sample to dryness in weighed beaker on water bath. Weight residue.	
Procedure 1. Heat to boiling for 5 min. Cool. Titrate with Soln. K to first permanent lather.	Procedure 2. Titrate with Soln K to first permanent lather.	Report as pH	Volume H ₂ SO ₄	Volume	Gms. Residue	Report as p.p.m. Fe
Record as "Volume A"	Record as "Volume B"		×	Ag NO ₃	0.02	(Note: Each ml. Soln M equals 2.0 p.p.m. Fe, when made to 50.0 ml. as described above.)
Volume A	×		20	×	=	
×	20		=	7.1	p.p.m.	
20	=		p.p.m. CaCO ₃	=	"total	
=	p.p.m. CaCO ₃		"total alkalinity"	p.p.m. Chloride as Cl.	solids"	
p.p.m. CaCO ₃ "permanent hardness"	"total hardness"					
Volume B—Volume A						
×						
20						
=						
p.p.m. CaCO ₃ "temporary hardness"						

PREPARATION OF SPECIAL SOLUTIONS AND REAGENTS FOR WATER ANALYSIS

Solution H—8N HNO₃.

Solution K—Dissolve 10 gms. pure castile soap shavings in 700 ml. 60% etharol. Filter. Standardize against CaCO₃. Adjust volume that 1 ml.=1 mgm. CaCO₃. Determine volume Soln K to produce permanent lather in 50.0 ml. distilled water. Subtract this figure from volumes A and B when making above calculations.

Solution L—50 gms. K₂CrO₄ per liter.

Solution M—0.865 gms. Fe (NH₄) (SO₄)₂. 12 H₂O+20 gms. H₂SO₄ per liter.

Methyl Orange Solution—1 gm. methyl orange per liter.

0.10N AgNO₃—16.99 gms. AgNO₃ per liter.

0.02 N H₂SO₄—0.981 gms. H₂SO₄ per liter.

0.10 N KSCN—10 gms. KSCN per liter.

TIONAL PHOTOGRAPHER Contributing Editor, enables the film lab chemist to check the adequacy of projected water supplies; to maintain the efficiency of water-softening equipment; and to prevent damage to the film from water spots and calcium sludge.

The system of analysis as outlined provides for the accurate determination of the significant constituents of raw and treated waters. The methods for the analysis of effluent wash water, and for the testing of the emulsion for completeness of washing will be given in a future issue of **INTERNATIONAL PHOTOGRAPHER**.

Multiple Toning

MGM Laboratory working toward greater elasticity and effectiveness from chemical toning and tinting processes.

Greater elasticity in the handling of toning and tinting now is being developed in MGM's laboratory by John Nickolaus and his staff, with the completion of the installation of the studio's new battery of toning machines. Possibilities of six or more different combinations of tints and tones for one film, based on a study of the emotional qualities sought for in various sequences in the picture, now are being checked up. Nickolaus and several directors are experimenting with various treatments and it is expected that the multiple toning may be first used along present modern lines in "Girl of the Golden West," starring Nelson Eddy and Jeanette MacDonald.

Greater richness of effects is also possible with combinations of tone and/or tint in a single sequence, now that the modern equipment installed is capable of handling the chemical toning efficiently and rapidly. Such effects would be obtained by chemical control so that certain shades of black and white with an affinity for one tone would be treated and those darker shades with affinity for another tone would get a different effect.

Nickolaus continues to insist that the toning revived at MGM, and since used by 20th Century-Fox, Columbia and Samuel Goldwyn, is not in any sense, nor was it ever intended to be, a substitute for color. Its sole purpose is to get away from the harsh coldness of straight black-and-white and create a pleasing but unobtrusive effect of rich photographic values. Samuel Goldwyn is reported to be highly pleased with the sepia toning job done by the MGM lab on his "Marco Polo."

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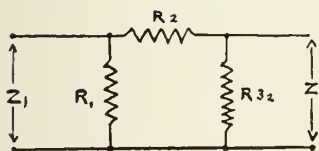
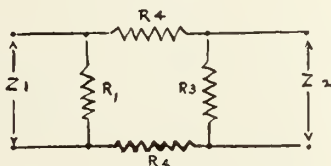
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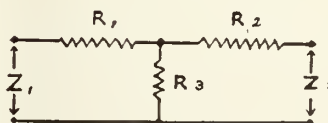
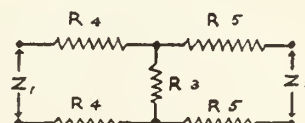
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Attenuation Network Data**TT Pad****O Pad**

$Z_1 = 500$ ohms

$Z_2 = 200$ ohms

T Pad**H Pad**

$Z_1 = 500$ ohms

$Z_2 = 200$ ohms

Loss in D. B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4
8.9	.3591	.....	387	258	193
10	.3162	742	451	255	225.5
12	.2512	698	589	250	294.5
14	.1995	662	760	244	380
15	.1778	645	860	240	430
16	.1585	629	973	236	486
18	.1259	602	1,235	230	617
20	.1000	581	1,566	224	783
25	.0562	545	2,857	214	1,428
30	.0316	524	4,980	208	2,490
40	.0100	508	16,730	202.5	8,365

Loss in D. B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4	R_5
8.9	.3591	387	0	258	193	0
10	.3162	390	22	222	195	11
12	.2512	397	57	170	198	28.5
14	.1995	411	85	131	206	42.5
15	.1778	417	97	116	208	48.5
16	.1585	423	107	103	211	53.5
18	.1259	435	125	81	218	62.5
20	.1000	446	140	64	223	70
25	.0562	468	166	36	234	83
30	.0316	479	180	20	239	90
40	.0100	493	193	6.6	246	96.5

Close-ups

By ED GIBBONS

International Photographer usually goes to press in time to appear around the 5th of the month, and generally holds open for as much late news as possible, hence it was planned to thoroughly cover the annual awards banquet of the Academy of Motion Picture Arts and Sciences, scheduled for March 3. The Southern California flood disaster caused postponement of the banquet for one week, and it was felt that it would be unwise to delay publication of the magazine until the middle of the month. Hence, awards news will appear in the April issue.

Magazine Pic Credits

The question of credits to still photographers on pictures emanating from Hollywood to the national magazines is being investigated by HERBERT ALLER, secretary of Local 659, IATSE, and managing editor of this publication. This is a sore spot with many studio photographers. A very cooperative disposition has been evidenced by such important publications as *Life*, which makes a particular effort to try and proportion credits properly. However, while some publications are not so inclined to extend the photographer due credit, the big problem lies with the studios. In many instances, the stamping of proper credits on the back of prints, which would be the easiest solution of the matter, is overlooked for one reason or another. It is to be hoped that this is a situation that will adjust itself through a cooperative spirit on the part of all concerned.

Photoflash Interest

SAMUEL ZAGET, partner in the KALART CO., who recently returned from his annual visit to the British Isles, reports that after years of indifference to flash photography, the English camera fans in recent months are becoming quite enthusiastic over its possibilities. Arrangements were made with the GEORGE H. POTTS of London to distribute KALART products for Great Britain and shortly after MR. ZAGET's return, a hurry-up trans-Atlantic phone call was put in for a rush order of synchronizers.

A Note of Warning

From HENRY J. HENNSBACH of C. P. GOERZ comes a memo that should be heeded by all photography fans. "Great care should be exercised by the buyer of second-hand used photo-lenses before

parting with his money," says HENNSBACH. "Such lenses are apt to be out of adjustment through careless handling without this damage being evident to the casual observer. The prospective purchaser should be wary especially of lenses which appear to be "new" and yet are offered at greatly reduced prices. Unless the buyer has the fullest confidence in the responsibility of the seller, he should make the purchase of a used lens subject to a check-up by the lens manufacturers for any possible defects in adjustment. We are certain that every reputable lens manufacturer will gladly do such checking up of his own product free or at a nominal charge."

British Annual

Photography Year Book, 1938, published by the British monthly journal, *Photography*, reached us last month. It is an interesting and complete record of much outstanding photography of the past year, including a main section of pictorial and commercial photography, interesting highlights of trick photography, a section on applied photography, such as murals, photos, posters, show cards, display material, etc., and a representative section on photography in advertising art, classified by industries. More than 1600 prints were selected by the British journal from the thousands it received during the year. There are 575 names listed among the contributors. The introduction is in three languages, English, French and German, and contributors are from 21 countries. U. S. readers who desire to may order the *Photography Year Book* through INTERNATIONAL PHOTOGRAPHER. It is priced at \$8.

The April issue of INTERNATIONAL PHOTOGRAPHER will be our 10th anniversary number and we want to remind manufacturers that we welcome notes and news pictures of progressive developments during the past decade. Editorial deadline for the issue is March 20th.

Gossip

June 20-23 dates have been set for the eighth annual National Conference on Visual Education by the conference council, and the place again will be the Francis W. Parker school in Chicago. Invitations have been extended to prominent speakers in the educational and advertising fields. The committee is lining up open forums, film exhibitions and discussions of production and distribution problems. DR I. E. DEER, representing WILL HAYS and the motion picture producers, will outline present and forthcoming plans of Hollywood in connection with educational films. In conjunction with the conference, a banquet will be given, honoring HERMAN A. DEVRY's 25th anniversary in the motion picture equipment manufacturing field.

The third annual U. S. ROLLEICORD-ROLLEIFLEX salon will open May 2nd at Rockefeller Center, New York, with exhibitors from all parts of the country expected to participate, and April 16th is the final deadline for entries, which should be sent to BURLEIGH BROOKS, INC., 127 West 42nd Street, New York . . . judges are ADOLF FASSBENDER, MARGARET BOURKE-WHITE and HERBERT C. MCKAY . . . memo from the Social Security board reminds that if you change your name by marriage or any other method, you should be sure to see that your Social Security record is revised . . . DANIEL S. MYERS, formerly in charge of dealers sales in the east for BURLEIGH BROOKS, moved to the coast last month to assume charge of the western territory, including California, Washington, Oregon and neighboring states, and will make his headquarters in Los Angeles, where he was well known until he joined E. LEITZ in the east in 1928 . . . he has been with BURLEIGH BROOKS since 1936.

Steadily improved business has brought the removal of J. BURGI CONTNER'S MOTION PICTURE CAMERA SUPPLY, INC., to larger quarters at 723 Seventh Avenue, New York . . . they now occupy the penthouse at the same address and have added a new and larger laboratory . . . readers of our recent article about the FLO-LITE continuous projector, now being manufactured in Louisville by a concern headed by JACK MORANZ, will be interested also in the MOVING WORDS PROJECTOR, an electro mechanical device, now being exploited by a Chicago firm of the same name . . . it is well adapted to theatre marquee stunts and will be described in detail in an early issue of INTERNATIONAL PHOTOGRAPHER.

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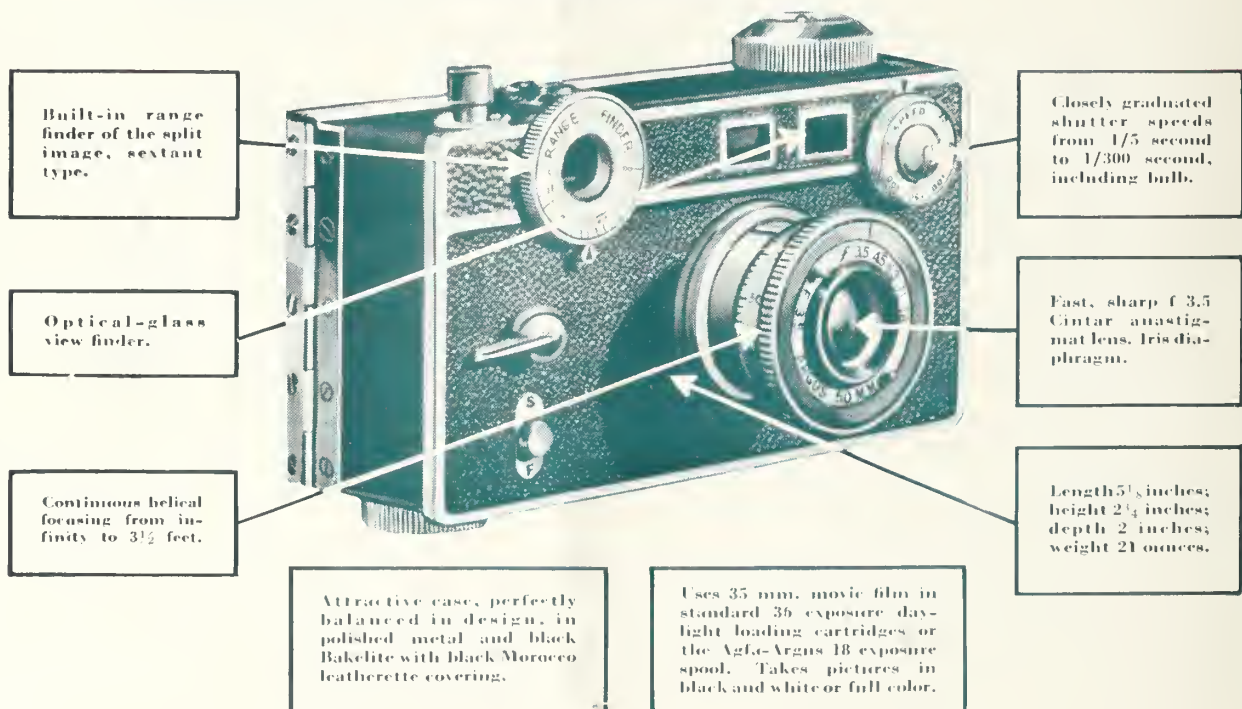
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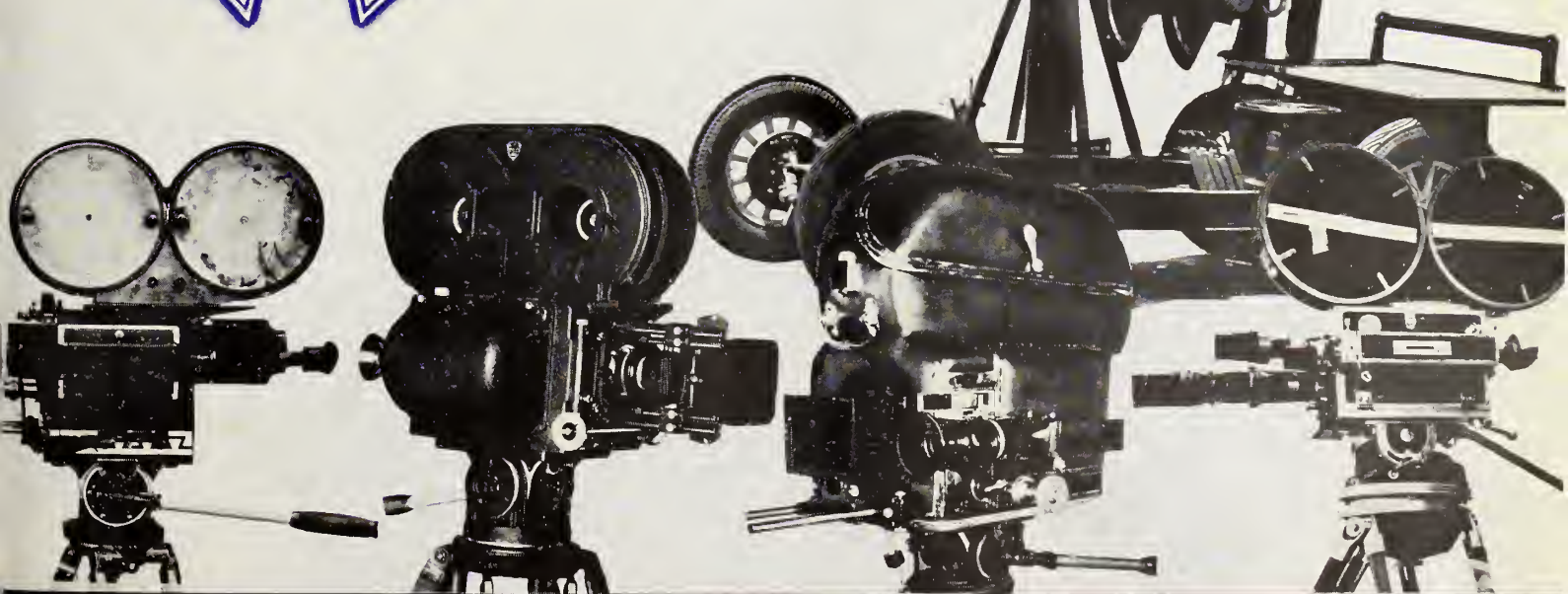
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Vol. X

Contents for April, 1938

No. 3

ON THE COVER. The 10th Anniversary cover, symbolical of a decade of publication in this magazine of the technical news of cinematography and allied arts and crafts, was composed photographically by Paul Allen from pictures supplied by James Murray, member of Local 659, IATSE, and the camera manufacturers. The modern cameras in the bottom strip are from left to right: 20th Century-Fox, RKO-Radio, the new silent Mitchell and the new DeVry newsreel camera. Seen on the Landers & Trissell rental crane, left to right, are: Andy McIntyre, assisting; and Tom Galligan, operating.

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Entered as Second Class matter, Sept. 30, 1930, at the Post Office at Los Angeles, California, under the Act of March 3, 1879.

International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

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Close-ups

By ED GIBBONS

With this issue INTERNATIONAL PHOTOGRAPHER celebrates ten years of service in reporting news of the arts and crafts of the motion picture, centering around photography. This is neither the time nor the place for patting ourselves on the back, for INTERNATIONAL PHOTOGRAPHER has done a good job in its field only through the support of studio technicians in contributing articles and pictures and of the manufacturing organizations catering to photography and allied fields with both articles and advertising.

The editors believe that the magazine still can stand plenty of improvement. That goes for the editor, managing editor and the able contributing editors. We shall continue to bend every effort towards the same emphasis on factual technical trade news reporting that has been our policy and we sincerely invite the suggestions and cooperation of technicians, executives, manufacturers and readers in the many film and photography fields outside Hollywood as to how INTERNATIONAL PHOTOGRAPHER can best serve them.

The major point in our program during coming months will be to concentrate on bringing about a closer contact between the craft workers—who in the theatres handle the finished product of the motion picture studios—the studio executives and technicians and manufacturers of equipment used in both studio and theatre.

This is in line with the general realization by all factors mentioned that there is a vital need for such technical and craft news cooperation. Leaders in all branches have personally expressed to the editors their approval of such a program.

We expect to concentrate also upon wider and more thorough news coverage of new equipment, new products, new ideas and methods that advance the technical side of motion picture entertainment and contribute importantly to the artistic and dramatic values of films.

A regular feature of INTERNATIONAL PHOTOGRAPHER is the Tradewinds Section, devoted to the presentation in an orderly standardized format of the fundamental facts readers wish to learn

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about new products. Any manufacturer desiring to be represented in this section, may at no cost or obligation, obtain blanks for supplying such information, by writing to INTERNATIONAL PHOTOGRAPHER.

Lack of space in this special issue did not permit inclusion of a report of new products or of our regular Tables on Cinematography by Fred Westerberg, Sound by J. N. A. Hawkins, Laboratory by D. K. Allison and Projection by William Comyns. These will resume in our May issue.

In passing into the second decade of INTERNATIONAL PHOTOGRAPHER's service as the industry's only professional journal covering all phases of motion picture arts and crafts, the editors sincerely hope that the magazine will continue to merit the support and cooperation of the members and friends of International Alliance of Theatrical Stage Employees in all phases of motion picture production and exhibition, and of the executives, department heads and the personnels of the manufacturing organizations, whose valuable help and support have enabled the first decade to end on a note of harmony and mutual service.



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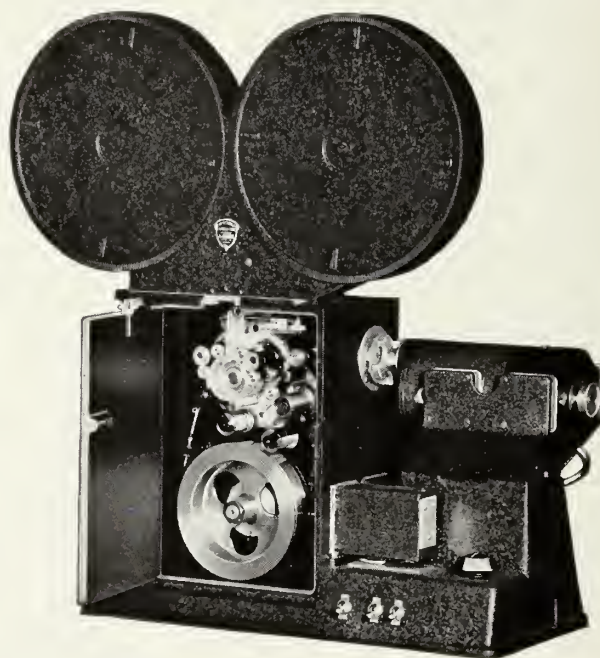
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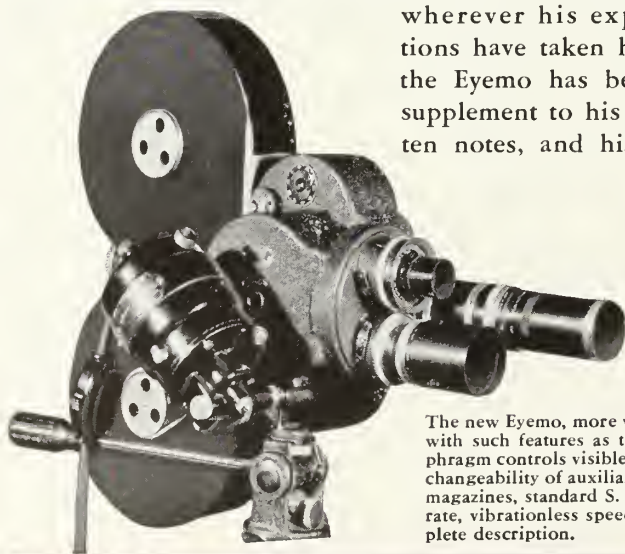
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HARRISON FORMAN—*Explorer, Author of "Through Forbidden Tibet," Technical Director of "LOST HORIZON," and Sino-Japanese War Photographer for "The March of Time," is shown here in the front-line trenches near Shanghai filming scenes of actual fighting.*

millimeter, Eyemo-made movies make his lively illustrated lectures second in their vividness only to first-hand observation.

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Tradewinds

HOLLYWOOD'S SERVICE ARMY

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It is often customary, when referring to the technical foundations of the motion picture industry, to refer sadly to Hollywood as being dependent upon sources located elsewhere for the development and improvement of its technical sinews. There was a time when this concept was literally true, but that was long ago. Today, a corps of specialists in every line of engineering related to motion pictures is active in Hollywood, developing and proving new materials and equipment for use in its studios and in every other center of production the world over.

Some of these specialized technical men are on the payrolls of the studios, but a large and important group are the contact engineers of firms supplying the industry with technical products. They exist not merely to sell their firms' products, nor merely to serve as "trouble shooters" when things go wrong, but to make the men on the production firing-line active partners in the evolution of products and equipment specifically suited to their problems. When the manufacturer must often plan his product for a broad usefulness, these specialists bend their energies to adapting existing products or developing new ones to solve individual problems. Some of the keenest technical minds in the world are to be found among these experts.

Probably the senior technical services in Hollywood are those maintained by the three great raw-stock manufacturers, Eastman, DuPont and Agfa. Huge investments in factories producing amateur films and allied products as well as motion picture film keep the manufacture of these products centralized in the east; but these firms' Hollywood experts learn at first hand what film characteristics Hollywood's cameramen need.

The manufacture of motion picture projectors has always been centered in the east. It might be expected, then, that projectors for projection background photography would have

been developed there. Instead, virtually all of the process projectors used in the world's major studios have been designed and built by two firms in Hollywood: Teague, and Neumatz. The reason is simple: a projector may be superlatively steady for theatrical work and yet wholly unfit for the more exacting demands of the projection background process.

Developing machines have been made in many parts of the world. But when a major laboratory in this country or abroad wants such a device, they seek out one or another of a handful



Eastman's Hollywood headquarters.



of men who have designed and built machines which have in actual production use in meeting Hollywood's major studio tests proved themselves the world's best.

Yet another field in which this specialized technical service has actively advanced the industry is in the field of lighting equipment. While the firms purveying incandescent globes and arc carbons do their manufacturing in the east, they maintain resident experts in Hollywood to cooperate with cameramen and studio electricians.

The light sources themselves are not Hollywood products, coming from General Electric and National Carbon, but the lamps in which they are used to light studio sets are designed and built in the film capital. Responsible for a major part of these lamps are the engineers of Mole-Richardson, Inc., who for more than a decade have cooperated intimately with the men who have made lighting itself an art, while a recent entry in this field, Bardwell & McAlister, also is making valuable contributions. G. E. and National Carbon, however, maintain regular service and research cooperation.

The two major sound organizations,



Top, the modern new Bell & Howell building in Hollywood. Above, Albert Summers Howell and Don J. Bell with a Standard B & H camera. Below, the B & H \$500,000 engineering lab, completed in 1929.

RCA and ERPI, also have staffs of able service and research men, while anything in cameras and other adjuncts to professional photography is always readily available from Mitchell, with its main plant in Hollywood, Bell & Howell, with a fine Hollywood branch, Duplex, Art Reeves, and Fried. Contributing to the many accessories and special contrivances so necessary in major studio production are firms like Studio Equipment Company, Al Grimley, O'Hara, Fred Hoefner.

The world-known Moviola film editing devices are Hollywood products, while the names of Scheibe and Harrison & Harrison, both film capital firms, mean tops in filters. And make-up leadership in the professional field is dominated by



the Max Factor organization, a pioneer Hollywood institution, which shares honors with the Westmores in hair-styling and wig creations.

Regardless of all promises on the horizon from other quarters, when you talk color, for all practical purposes it means but a handful of firms, with Technicolor and Cinecolor, both centered in Hollywood, in the dominating position. Eastman's Kodachrome, the subject of wide amateur use, is not yet developed for professional purposes, but under a special agreement, Eastman and Technicolor are cooperating on research toward such development.

Another feature of the Hollywood technical community is the rental and service group. Every type of photographic and allied equipment is available from such firms as Landers & Trissell, Faxon Dean and Henry Kruse; while the two big camera shops, Hollywood Camera Exchange and Camera Supply Company, also specialize in professional rentals, both for use and as props. They have extensive lines of historical interest.

Art Reeves, who last month took over direction of the latter company, which he owns, also has expanded his manufacturing plant. With 7000 sq. ft. of floor space, Reeves now has 12 mechanics busy, and has added his own glass blow-

ing department and also is manufacturing developing machines.

Morgan Camera Shop, specializing in miniature photography, carries an extensive line and specializes and prints service, while a new still lab, owned by Neville Reay and Fred Parrish, member of Local 659, is specializing in fast service with a

large capacity. Sound facilities also are available from such organizations as Glen Glenn and Balsley & Phillips, in addition to the General Electric and RCA facilities on the bigger rental lots.

An interesting special service is that of Jack O'Hara, who features camera cars and electrical horses.



Max Factor's modernistic Hollywood plant.



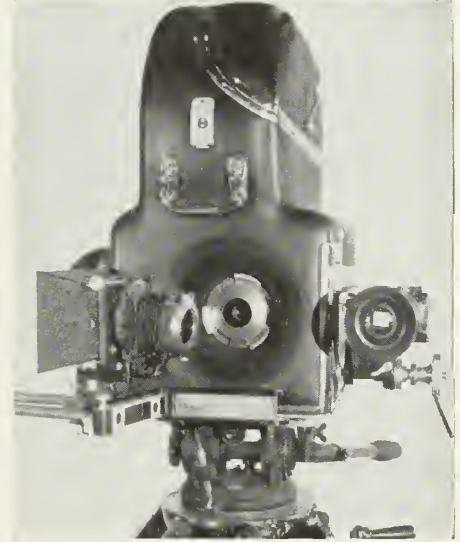
These shots of the Hollywood headquarters of Smith & Aller, distributors of Dupont film, were published in International Photographer for December, 1929, when the building was completed and opened for service.



UNUSUAL LIGHT SETUP. This wierd shot, captured by the still camera of Bert Six, member of Local 659, IATSE, at Warner Brothers, shows one of the largest setups for projected shadows ever made in a motion picture studio. It was the idea of

Bert Longworth, veteran 659 still photographer, seen at his camera at the right. The electrician is Martin Murphy, member of Local 37, IATSE. Players are Claire Trevor and Edward G. Robinson. The illustration is for Warners' "The Amazing Dr. Clitterhouse."

Camera



Three shots of the new type portable silenced camera designed at RKO-Radio studios with a companion easily operated dolly.

PHOTOGRAPHY BACK ON TOP

Technical progress in improving quality plus freeing lens from restrictions of microphone restores camera to prime spot as story telling medium of industry.

Progress in photography during the past ten years has been the victory of an army rather than spectacular achievements by a few heroes. This is most clearly evidenced by the fact that the pictures which won the Academy awards

in the first half of the past decade, today would not rate technically with the average "B" picture. The difference must be attributed to many factors.

The cameraman and soundman today have smoked the pipe of peace and with

the aid of a score of new refinements, improvements and a sincere attempt to coordinate their work, have returned to the camera the prime job of telling stories on the screen. The efforts of hundreds of experts in all lines from equipment manufacture to the film laboratory, have resulted in getting the camera out of the icebox booths that were the trade-mark of the early sound era.

Panchromatic film, which came into vogue from 1924 on, reached its peak of development during the past decade. The perfected emulsions, with their faster and finer grain, much more evenness and stability, the better constructed and more efficient light sources, both incandescent and carbon, the progress from the rack and tank system to developing machines in the laboratory, plus better formulas, temperature, and dust control, all in the hands of experienced technicians; fine cooperation by set designers and property departments in the blending of paints, construction and arrangement of sets advances in make-up tech-



Compare the light modern cameras on these pages with the huge "ice box" that housed this Mitchell camera in 1930. This picture was published to illustrate a device developed by Joseph Walker to accurately focus outside the bungalow.



The silent DeBrie, brought out last year, in action on a set at 20th Century-Fox. Director in center is H. Bruce Humberstone.

nique and materials, all have contributed to the fine modern photography that is the average rather than the exception.

To these important developments must be added the sensational benefits obtained from optical printing and back-

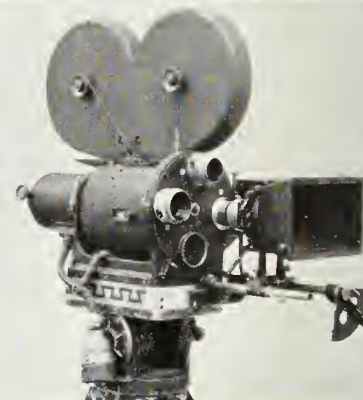
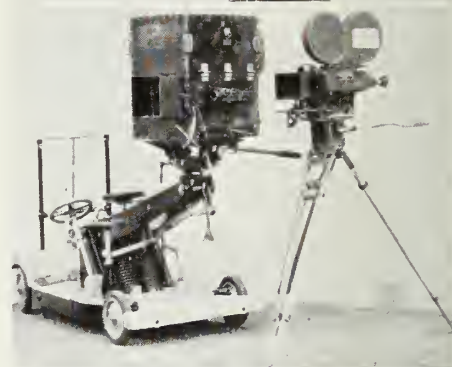
ground photography, and the coincidental development of truly precision equipment, even to the construction of cranes and dollies such as cameramen of previous years never would have dared to imagine; and the editing efficiency of the Moviola must not be overlooked, nor the Cinex light tester.

Today the cameraman is freed from many restrictions, and is assured by other departments of technical excellence for which he alone previously was responsible. He, therefore, may concentrate his attention upon photographic composition and effects that will have outstanding pictorial and dramatic values.

The motion picture camera itself, today is a superb piece of designing and construction, fitted with precision lenses and control devices designed for maximum efficiency under motion picture production conditions. Mitchell, Bell & Howell, RKO-Radio, 20th Century-Fox, DeVry, DeBrie and Duplex cameras, illustrated herewith, are the last word in photographic efficiency with 35 mm. film.

Precision construction of the working parts of modern cameras, to very minute tolerances, has resulted in much quieter action and steadier photography and projection reproduction. Speeds available have been increased, due to the progress in adapting the camera from the nominal silent speed of 60 feet per minute to the 90 feet per minute demanded for synchronization with sound on the film.

Constant speed was another necessity for sound and color. The motors now used to run the cameras are super efficient for their bulk and weight. Due to



The light and extremely portable blimpless camera developed during the past two years at 20th Century-Fox. Note the comparative size alongside blimped camera.



The brand new silent Mitchell camera, now in use at Warners-1st National.

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A new camera car that has five tripod heads for Mitchell or Bell & Howell cameras, offering over 50 possible setups, including from 6 inches above the ground to 16 feet.

This gear is built on a Lincoln chassis and is capable of carrying the cameras and crew at any speed up to 60 miles per hour with safety and steady photography.

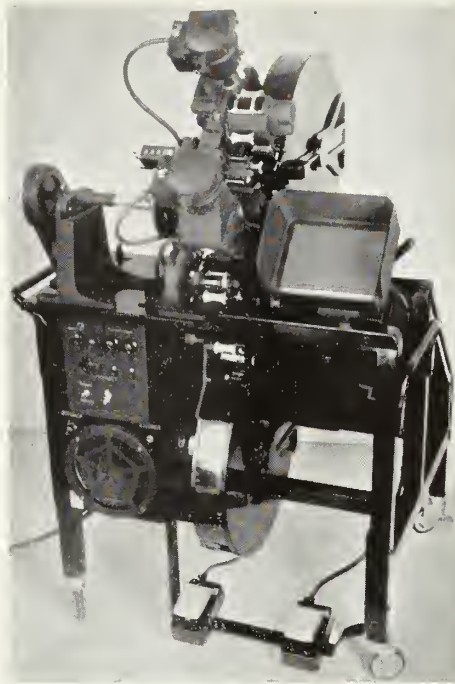
The car is equipped with movable reflector stands and many other features.

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Motion Picture
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LOCAL 705

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Congratulations to
INTERNATIONAL PHOTOGRAPHER
on its 10th Anniversary

Members of International Photographers Local 659, IATSE & MPMO, are proud to be the sponsors of the industry's outstanding technical publication. It is typical of the real spirit of the "I.A." that this journal presents monthly an excellent coverage of the progressive developments and new ideas that help the motion picture industry and the industry's technicians, without injecting politics or propaganda into its columns. The "I.A." never has depended upon propaganda to benefit its members. In these days when every faction and group has some pro or con story to sell, it is a real pleasure to have one publication in the industry that objectively reports the type of technical news we want to read, and which supplies us with valuable data obtainable through no other medium.

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Still Photography, Specializing in Action Shots

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Recent Assignments:
for....

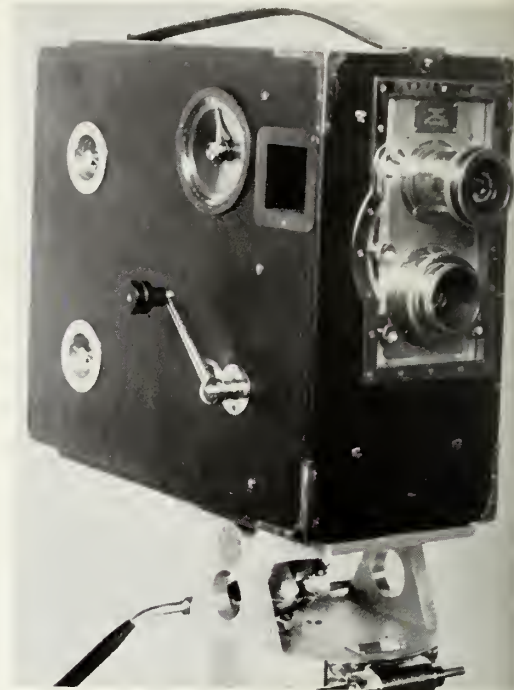
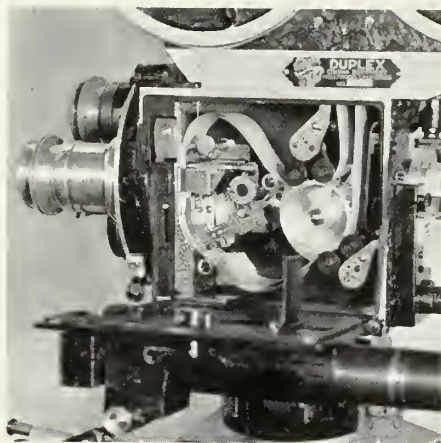
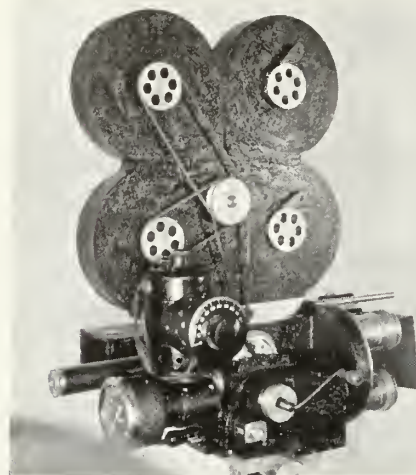
Castle Films
March of Time
Chicago Cubs for
P. K. Wrigley

TRIPLE-PROVED

PHOTOGRAPHIC quality . . . fine grain . . .
speed . . . Eastman Super X has been proved
more than adequate on all three counts. It
is the unusually happy combination of these
qualities in one film that has made Super X
the most outstanding negative material
in the entire motion picture field. Eastman
Kodak Company, Rochester, N. Y. (J. E.
Brulatour, Inc., Distributors, Fort Lee,
Chicago, Hollywood.)

EASTMAN *SUPER X*

PANCHROMATIC NEGATIVE



Above and at left are two shots of the new Duplex Super Camera, while the box-like design at right is that of the first Bell & Howell box model camera, first manufactured in the fall of 1907.

the increase in speed it was possible to increase the capacity of the film magazines from 400 to 1000 feet and eventually, to coordinate studio and projection practice to the new technical advances, the industry adopted a standard 2000 foot reel for release purposes, which was sponsored by the Academy of Motion Picture Arts & Sciences Research Council in 1935-36.

Lenses available to the oldtime cameramen were improved greatly during the past 20 to 30 years, but it was during the past decade that finely designed and corrected lenses, as fast as $f:1.8$ were developed to match the new motion picture emulsions. Also, a much wider variety of focal length in lenses is available today.

The combination of high speed lenses and faster emulsions, not only extended the cameraman's work day and allowed him wider range in the use of filters to secure more artistic effects, but it also was responsible for the great success of

miniature still photography, which came into vogue during the past ten years.

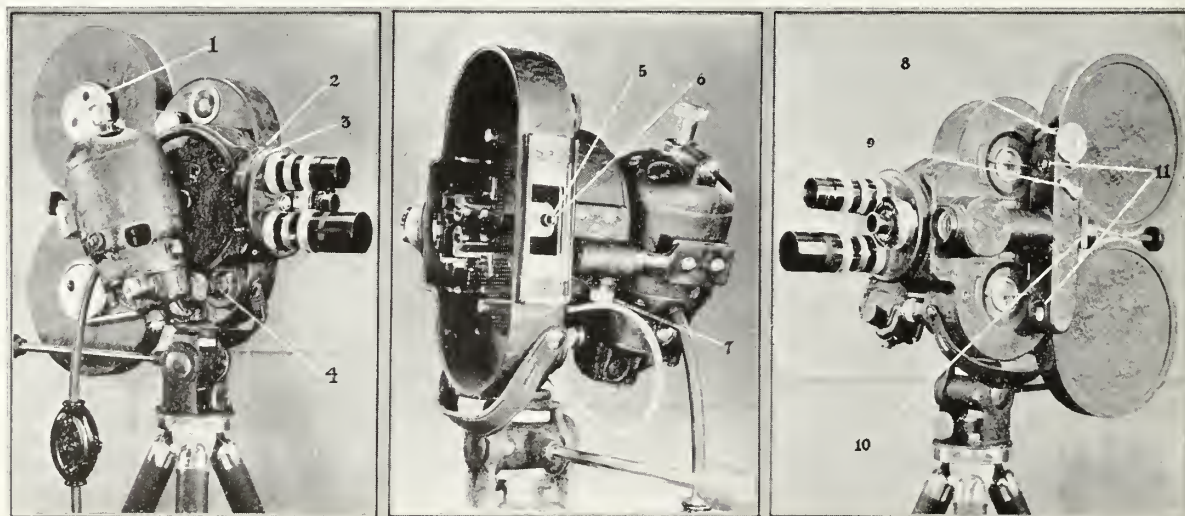
The pioneers, Leitz and Zeiss, with their Leica and Contax cameras, made the so-called "candid photography" an international by-word primarily through the manufacture of cameras that took advantage of the readily available, nominally priced 35 mm. motion picture film—with its great variety of all types of emulsions, and the new super lenses developed to meet the problems of cinematography. Today there are over 100 makes of miniature still cameras on the market, while during the past three years, International Research Corporation, after considerable success in the popular priced radio field, invaded photography with the first complete popular priced miniature photography line, the Argus.

The first Argus, at \$12.50, followed

this year by a new Model "C" with built-in range finder at \$25, has forced a radical revision in camera design in the brackets below the super-precision expensive models such as the Leica and Contax and their competitors, and the direct view Kine-Exakta.

Motion picture progress also made color available to the 35 mm. field with Eastman's Kodachrome and Dufay's Dufaycolor, both one shot natural color films available throughout the world to miniature fans.

While the studios, recognizing the vogue for candid shots, but on the other hand realizing the dangers to expensively built up personalities through indiscrimi-



Bell & Howell deserves considerable credit for development of 16 mm. motion picture photography. This pioneer company, which played a major role in the trend to precision design in photographic machinery, made many important contributions to camera manufacturing. A typical example is this motor driven Filmo, which was brought out in 1933, and was described in detail in the August, 1933, issue of International Photographer. The numbers in the above illustration refer to:

1—Knob for turning over motor by hand for threading. 2—Starting button. 3—Lever to throw gravity catch in or out of engagement. 4—Handcrank socket on camera. 5—This pin is operated by closing door latches. It opens magazine valves when camera door is being opened. 6—Magazine locking screw engages here. 7—Screw which locks motor in place. 8—Range finder dial. 9—Range finder lever "in" position. 10—Prism on eyepiece to enable user's head to clear the magazine. 11—Optics of range finder.

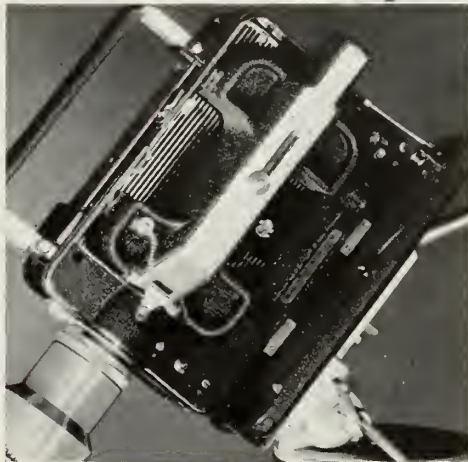
A NEW ACCESSORY

THE FOCUSING FINDER

FOR

MAGAZINE CINÉ-KODAK

ADDS CRITICAL ACCURACY
AND GREATER VERSATILITY
TO OPERATING EASE...



● ABOVE: The filmer is preparing to make a close-up of a goldfish, using Magazine Ciné-Kodak and its 4-inch telephoto lens. He is looking through the eyepiece of the Focusing Finder which is in position in the camera, and is focusing the lens. The camera is on a Ciné-Kodak Tripod—for which an adapter base for Magazine Ciné-Kodak is available. For light, he is using Kodaflector, Eastman's \$5 reflector, and Photoflood lamps. On the shelf are magazines of Kodachrome Film, Type A for Photoflood, and the Compartment Carrying Case for Magazine Ciné-Kodak and extra lenses.

● LEFT: The Focusing Finder is shown in position in the Magazine Ciné-Kodak—it is slipped into and out of the film magazine chamber between shots.

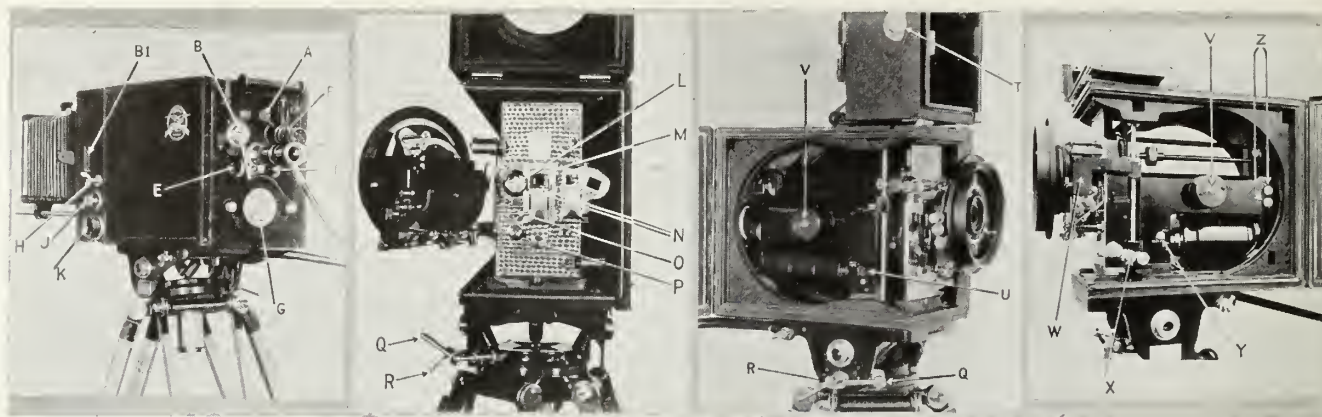
ITS effortless loading and its great versatility have won thousands of enthusiastic users for Magazine Ciné-Kodak. Loading in three seconds with film packed in light-tight metal magazines, with three speeds, fast 1-inch *f*.1.9 lens, and seven interchangeable accessory lenses—ranging from 15 mm. wide angle to 6-inch telephoto—it's the ideal camera for the more advanced filmer. This scope is now further increased through a new accessory—a reflex Focusing Finder for Magazine Ciné-Kodak.

This finder adds to magazine-loading and interchangeable lenses, two more important features characteristic of the professional motion picture camera—positive precision focusing and visual determination of

field covered by the lens. These advantages are especially desirable for close-ups, telephoto shots, and in titling. The Finder is slipped into the camera in place of the film magazine, between shots, and is effective with any of its eight interchangeable lenses—and at any distance. Of cast aluminum, weighing 8½ ounces, the Focusing Finder for Magazine Ciné-Kodak is \$20.

Whether your filming plans are making simple personal records—or more ambitious productions, you won't outgrow the Magazine Ciné-Kodak. Through a full line of precision accessories, it will keep in step with your increased demands. See this remarkable camera, its accessory lenses and the Focusing Finder at your Ciné-Kodak dealer's.

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



Introduction of sound ten years ago brought immediate stirring by technicians for a camera movement silent enough to be used on sound stages and locations without a blimp. One of the first manufacturers to bring one out was the pioneer French firm of Andre DeBrie. Their DeBrie Super Parro was brought out in 1933. Details referred to by numbers in the illustrations above are: A—Knob for shifting of Ground Glass; B—Focusing Dial; C—Focusing Tube; D—Speed Indicator Dial; E—Footage and Turn Corner; F—Locket and Switch with Electro-Magnetic Cut-out; G—Hand-crank and Opening

for removal of Motor; H—Automatic Fade and Lap Dissolve; J—Hand Fade; K—Knob for Locking Case; L—Ground Glass; M—Intermittent Pressure Plate; N—Register Pins; O—Film Punch; P—Pivot for Gate and Ground Glass; Q—Pan Adjustment; R—Tilt Adjustment; T—Knob for Closing Shutter; U—Oil Level; V—Take-ups; W—Switch for Automatic Fade; X—Automatic Switch for Anti-buckling Device; Y—Gear Shift for Motors of 1500 or 2400 RPM; Z—Knobs for setting Footage and Turn Counters to zero.

nate and unattractive candid photography of the stars, adopted miniature photography for still work to assure a reasonable control of this type of printed art, the backbone of studio still photography is the familiar 8x10 view camera, in a number of makes, and the ever reliable Speed Graphics.

Equipped with modern range-finders such as the Kalart company's excellent device, and utilizing the improved photo-flash equipment and bulbs now on the market, these rapidly handled cameras, favored by press photographers, are getting excellent results, particularly with the fast new Agfa and Eastman films introduced during the past few years. Here again, still photography has benefited from the research of the motion picture film technicians for faster emulsions that still would have fine grain and quality.

Studio stillmen are called upon to supply an ever increasingly large number of pictures for publication in newspapers and magazines and an army of expert cameramen, all members of Local 659, is engaged in this work. At the present time, there is a definite trend toward bringing the larger still cameras up to date in design and efficiency. An ex-

ample of the type of planning under way along these lines, is the new light and versatile 8x10 camera, designed by Gordon Head, member of Local 659, IATSE, on Page 24 of this issue.

While the industry had its steady progress in gaining control of sound, projection background photography, modern precision equipment and in improving still photography and mastering the candid camera craze, color went up and down like an elevator.

During the early days of sound, enthusiasms for other technical ideas were many and color and wide film were the two big rages among the prophets of progress. Wide film faded into oblivion but color, after a fadeout that seemed permanent, came back strongly during the past few years, principally through the determination and fighting spirit of Dr.

In the May Issue

Jack Aloin, veteran fan magazine photographer, member of Local 659, IATSE, who is noted for his speed strip photography, gives pointers on how to get the best results with this type of work.



Modern streamlined major studio portrait gallery is typified by these Columbia studio scenes illustrating the headquarters presided over by Whitey Schafer, member of Local 659,

IATSE. In addition to modern lighting and prop facilities, the gallery has dressing rooms and professional make-up facilities.

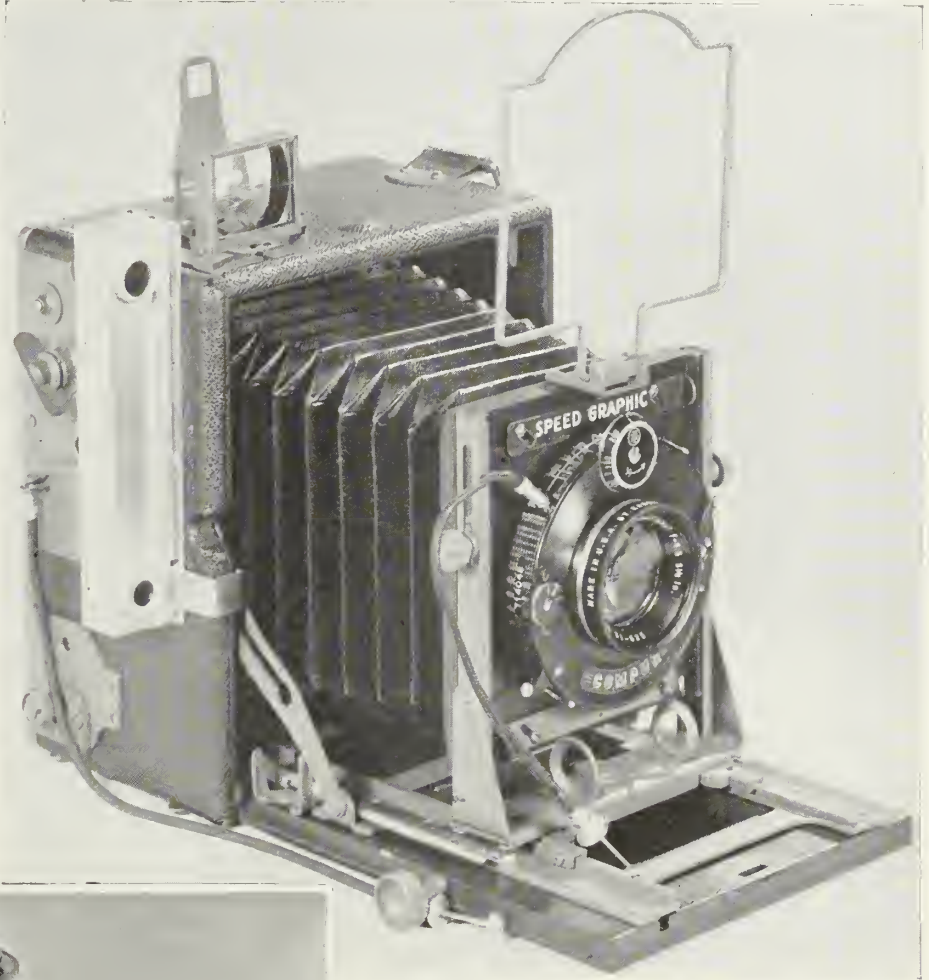
Herbert T. Kalmus and his Technicolor organization.

During the first few years of sound every studio tried color, but while sound progressed, color and musicals finally became anathema to production heads. Warners revived musicals as we know them today with "42nd Street," while Technicolor brought back color photography with its three-color process.

The revival of color also was aided by Eastman's progressive step in throwing its natural color single base Kodachrome on the market for sub-standard and candid photography, thus finding a great experimental medium and awakening the industry to the eventual prospect of practical color photography that would be close to black-and-white shooting conditions and could be speedily and economically processed.

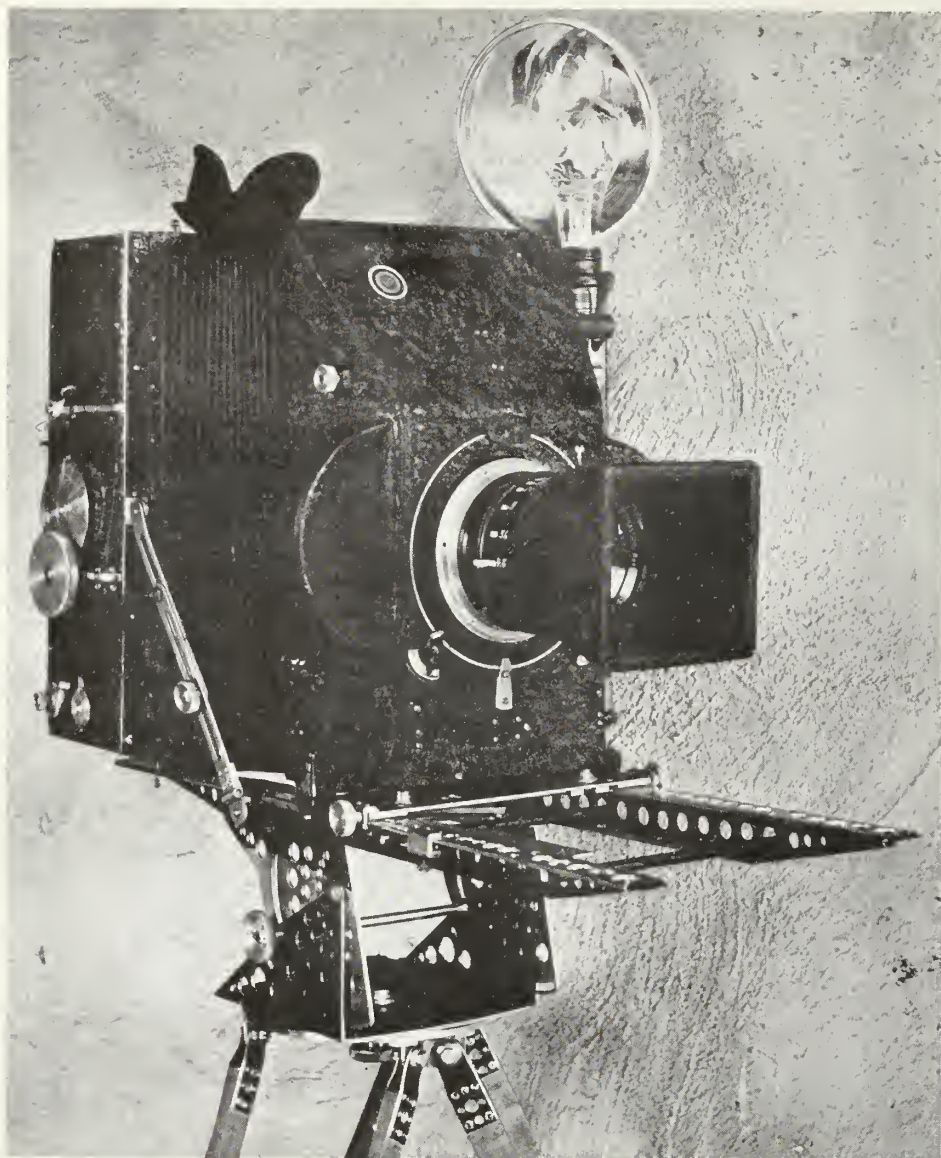
Since color is as much dependent upon the processing as upon the photography, the major technical points of color progress will be found in this issue's Laboratory Section, written by Contributing Editor D. K. Allison, who has been chemical research consultant to most of the important color organizations during the past ten years.

Coincidental with Kodachrome and the



Backbone of still photography, used by newsmen and studio stillmen are the 8x10 view cameras and the Speed Graphics in several smaller sizes. Speed Graphic illustrated is equipped with Kalart Range Finder. Picture of latest thing in the bigger cameras appears on Page 24. Below is illustrated the increasingly popular Kine-Exakta, outstanding reflex type miniature camera. This is a truly precision job with a single lens mirror system as shown at lower right. The larger Exakta and the Korelle Reflex top the field in the latter type of direct view cameras. As regards leadership in miniature candid photography, studio stillmen divide their allegiance pretty evenly between the Leitz and Zeiss lines of Leica and Contax cameras.

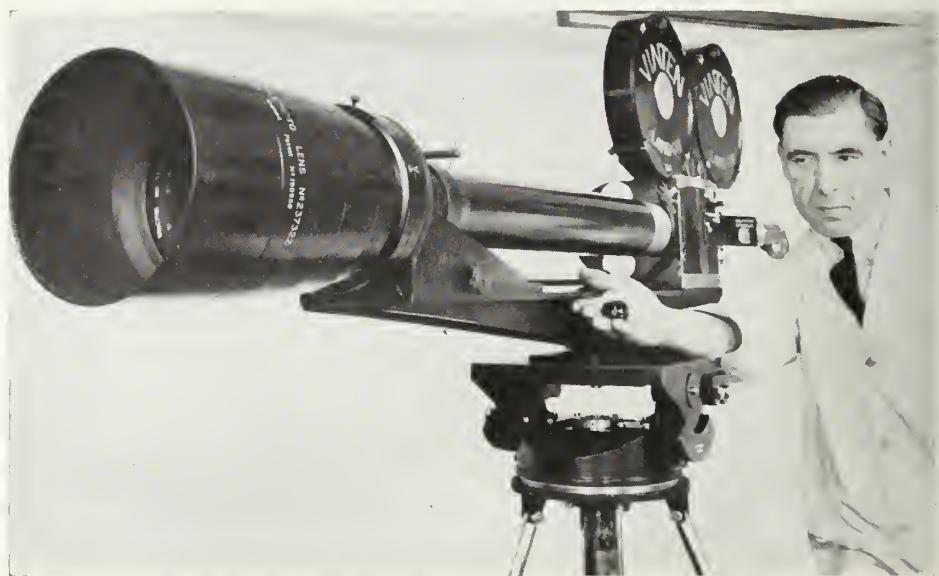




This new all-metal 8 by 10 speed camera was designed for professional photographers for both action and portrait photography to be used especially in motion picture work by Gordon Head, member of Local 659, IATSE. The camera is of a light, strong, and scientific metal design with a built-in variable opening focal-plane shutter, operating at from 1/2000 part of a second down to 5 seconds and all the in-between speeds. The camera enables the operator to view the photographic image up to the time that the exposure is made. Other features are: Tilt and swing back, revolving back, and operating position close to back of camera so that all adjustments may be conveniently made. The tripod shown, also was designed especially for this camera and features lightness and convenient operation.

three-color Technicolor came an international upsurge of interest in natural color still photography for graphic arts purposes. This field has probably been exploited with more vigorous bunkum and wild promises than any aspect of pho-

tography since the camera obscura first dawned upon Leonardo Da Vinci.



This is the biggest motion picture camera lens ever made, a 58-inch Telephoto f:8, manufactured by Taylor and Hobson, Ltd., of Leicester, England, for the English firm, W. Vinten, Ltd., and used to photograph last year's Coronation for Pathe Gazette.

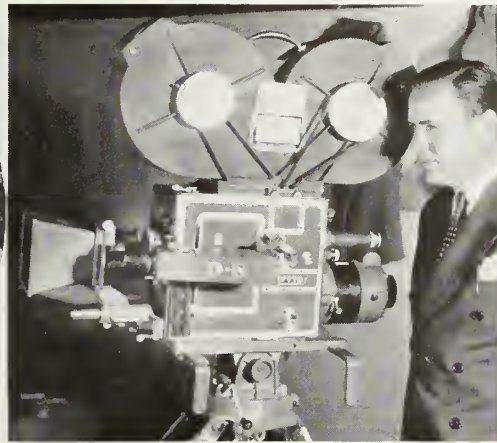
In the May Issue

Charles R. Hoffman, veteran member of Local No. 683, IATSE, (Laboratory) who has an extensive background in practical work on color still separations, starts a series of informative articles on this much-discussed subject.

Good color photography, transmitted into good engraving and offset plates, and excellent billboard lithography, have been available to the graphic arts trades for some time. But they are expensive processes. Generally for publication purposes they have been restricted to advertisers with big budgets and the slick magazines.

A number of outstanding photographic artists in the eastern advertising centers, and in Hollywood, such men as George Hurrell and Jimmy Doolittle, members of Local 659, IATSE, have been making outstanding color shots for commercial purposes. But this high type of work, costing far beyond comparison with even the most expensive black-and-white, was not suitable to meet the rush toward color, particularly by the nation's newspapers, who have become increasingly color conscious during recent years with the development of good color printing on newsprint and in rotogravure.

Since 1933, there has been an increasingly heavy pressure on studio publicity departments from the press and magazines for color news pictures. Kodachrome and Dufay separations, one shot cameras of all types, and scores of pro-



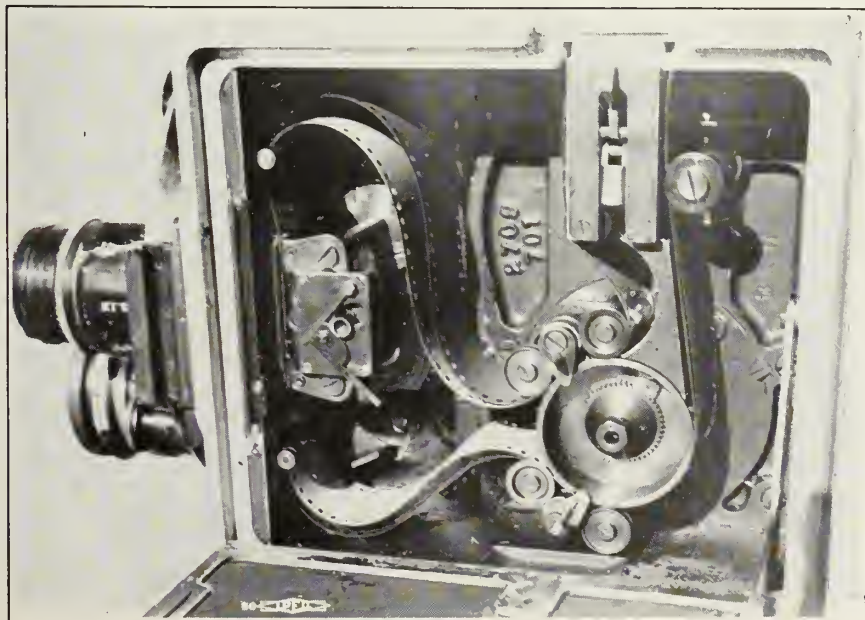
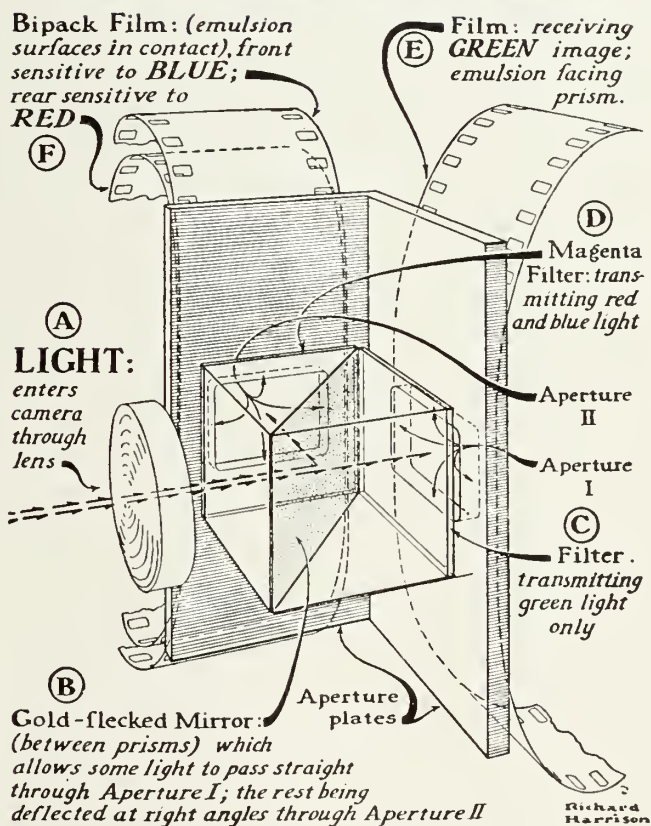
cesses for getting three and four color engravings have been experimented with. Thousands of dollars have been invested by the major studios in experimental laboratories, the construction of color cameras, costing \$5000 and up.

While some progress has been made in various directions, the color situation with regard to stills, is as yet chaotic and uncertain. This is a field that will well repay serious and cooperative investigation by the industry's technicians. Recently there have been signs of a more realistic and practical approach to the problem.

Color stills today are in the heachache classification, and intelligent exploitation executives are beginning to realize that the only sane solution is the training or acquisition of competent technicians in all branches of the work from the actual photography to the laboratory processing.

The most important angle on color still photography is accurate and consistently standard control of every operation from the click of the shutter on. To insure such control, an orderly program of gathering and arranging technical data must be undertaken.

Ray Rennelhan, member of Local 659, IATSE, and ace color cinematographer, with the Technicolor three-color camera, new in 1936. Center oval shows Rennelhan with old type two-color camera. At right, through courtesy of Fortune magazine, is reproduced an explanatory layout of the Technicolor three-color camera's system. Below, a close-up of the Multi-color two-color camera of the early 30's.



The color still situation can be said to have been solved only when photographers can shoot pictures and know definitely what the finished result will be; and when materials and methods have been brought under control so that color stills in volume will not extravagantly exceed the cost of black-and-white. This problem should offer an interesting challenge to the skill and determination of photographers and research technicians.

In the May Issue

D. K. Allison gives directions for electrometric titration in laboratory practice, using the pH control meter.

1937 ACADEMY HONORS

The 10th annual awards of the Academy of Motion Picture Arts and Sciences were presented at the Biltmore Bowl in Los Angeles, March 10, honoring outstanding achievements in motion picture production during 1937. The awards honors were so thoroughly reported in the daily and trade press, that this digest of the awards recipients is published merely for the record:

Best Production—"The Life of Emile Zola," (Warner Bros.).

Best Performance, Actress—Luise Rainer in "The Good Earth," (M-G-M).

Best Performance—Actor, Spencer Tracy in "Captains Courageous," (M-G-M).

Best Supporting Actress—Alice Brady in "In Old Chicago," (20th Century-Fox).

Best Supporting Actor—Joseph Schildkraut in "The Life of Emile Zola," (Warner Bros.).

Best Direction—Leo McCarey for "The Awful Truth," (Columbia).

Best Assistant Director—Robert Webb, "In Old Chicago," (20th Century-Fox).

Best Original Story—William A. Wellman and Robert Carson for "A Star Is Born," (Selznick-International).

Best Screenplay—Norman Riley Raine, Heinz Herald and Geza Herczeg for "The Life of Emile Zola," (Warner Bros.).

Best Cinematography—Karl Freund, "The Good Earth," (M-G-M).

Best Art Director—Stephen Gooson, "Lost Horizon," (Columbia).

Best Sound Recording—Thomas Moulton, "The Hurricane," (Samuel Goldwyn).

Best Musical Composition—"Sweet Leilani," Harry Owens, in "Waikiki Wedding," (Paramount).

Best Dance Direction—Hermes Pan, "A Damsel in Distress," (RKO-Radio).

Best Film Editing—Gene Havlick and Gene Melford, "Lost Horizon," (Columbia).

Best Scoring—"100 Men and a Girl," (Universal).

Outstanding Shorts—One-reeler, "The Private Life of the Ganets," (Educational); two-reeler, "Torture Money," (M-G-M); cartoon, "The Old Mill," (Walt Disney); color short, "Penny Wisdom," (Pete Smith-M-G-M).

Thalberg Plaque, to Darryl F. Zanuck.

Special awards—Mack Sennett, Edgar Bergen, W. Howard Green, Museum of Modern Art Film Library.

Scientific or Technical Achievement Awards:

Report of the Board of Judges. After a careful consideration of the devices, developments and equipments submitted for consideration for recognition for Scientific or Technical Achievement, the Board of Judges, with the approval of the Academy Awards Committee, has agreed that Awards for Scientific or Technical Achievements should be granted as follows:

AWARD IN CLASS I (*Academy Statuette and Plaque*):

To: The Agfa Ansco Corporation for their Agfa supreme and Agfa ultra speed pan motion picture negatives.

The Agfa Ansco Corporation, in making available to the motion picture these two new panchromatic films has provided the production cameraman with a means of reducing working lens apertures, resulting in increased definition, and has provided a tool to obtain, under adverse conditions, high quality photographic results heretofore impossible.

In addition, the use of this film increases the latitude, the realism, and scope of process projection work.

The development of these two films represents a major achievement in research and emulsion manufacture, reversing what has long been considered an axiom by manufacturers and users of film stock, namely, that an increase in speed is always associated with increased grain size.

These two new panchromatic films retain to the full extent the qualities of panchromatic emulsions and at the same time provide a much higher speed while maintaining former grain quality. Thus, the Agfa Ansco Corporation has provided the motion picture industry with a product which increases the photographic quality of production and tends to lower lighting costs.

AWARDS IN CLASS II (*Plaque*):

To: Walt Disney Productions, Ltd., for the design and its application to production of their Multi-Plane Camera.

The multi-plane camera is a development of the Walt Disney Studios which has greatly improved the photographic quality and illusion of depth in color cartoons, simplified process work, and is believed to be capable of extension to process and transparency background problems normally encountered in studio production.

To: The Eastman Kodak Company for two fine-grain duplicating film stocks.

It has been recognized that duplicating films of sufficiently improved characteristics are of value in protecting against loss through damage to the original negative, as well as for making additional complete copies of the negative from which release prints may be made, and for use in optical printing.

In these two duplicating emulsions, the Eastman Kodak Company has made available duplicating stock which is an improvement over any previously available, permitting duplication quality very closely approaching that of the original and at the same time markedly reducing the effects of grain size formerly found to an objectionable degree in such duplicating films.

To: Farcot Edouard and Paramount Pictures, Inc., for their development of the Paramount Dual Screen Transparency Camera Setup.

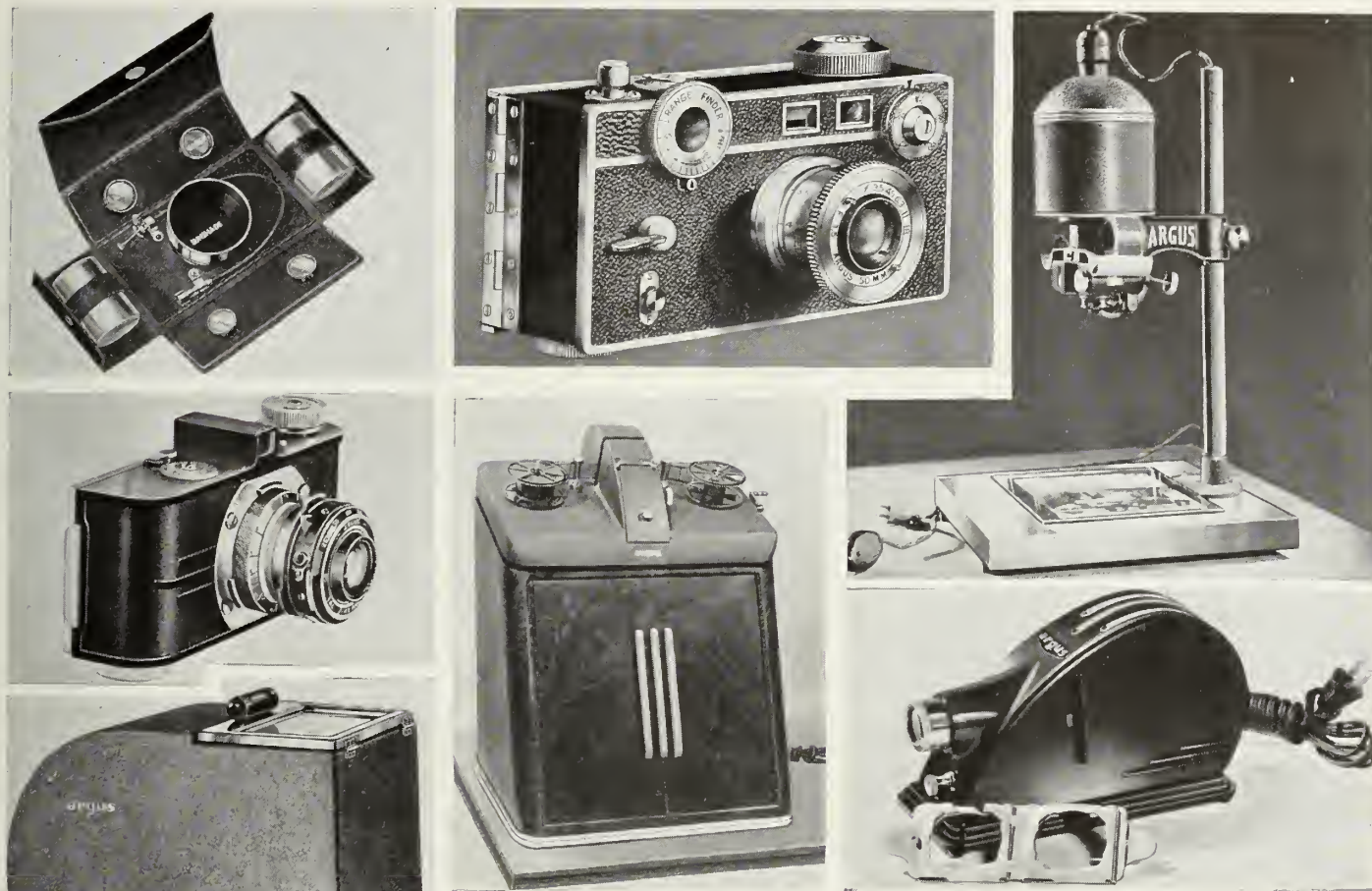
The Paramount Dual Screen Transparency Camera Setup consists of two synchronized photographic cameras driven by a single motor, mounted side by side in such manner that adjacent edges of the two fields of view are coincident regardless of distance (from the camera to infinity), permitting close screen action and a screen area of twice the width of the normal camera setup.

This unit, by providing transparency backgrounds of twice the area of a single screen, has increased the scope of process background photography and proved of definite economic value in motion picture production. It photographs, with absolute synchronism, action taking place across the two screen areas, regardless of distance from the camera, thus permitting a perspective and panoramic effect not otherwise possible in greatly enlarged projected pictures.

To: Douglas Shearer and the Metro-Goldwyn-Mayer Sound Department for a method of varying the scanning width of variable density sound tracks (Squeeze Tracks) for the purpose of obtaining an increased amount of noise reduction.

The application of "squeeze" to variable density recordings affords an increased amount of noise reduction over that available with other current methods, resulting in greater reproduced volume range in the theatre.

With this method, the scanning width of the variable density sound track is reduced during periods of normal low modulation and accompanied by a corresponding increase in



Highlights of the Argus line, manufactured by International Research Corp. Top left, the sunshade and filter kit for the new Model "C" Argus; center top, the new \$25 Model "C" Argus; top right, the Argus Model "E" Enlarger; middle left, the Model "AF" Argus and below, the Argus Jiffy Printer; center, the Microfilm Reader; and middle right, the Model "CP" Projector.

the percentage of modulation, often resulting in the recording of a truer wave form.

The use of this method leads to an increased volume range in the theatre, lending an added color and naturalness to certain types of productions.

AWARDS IN CLASS III (*Honorable Mention in the Report of the Board of Judges*):

To: John Arnold and the Metro-Goldwyn-Mayer Camera Department for their improvement of the semi-automatic follow focus device and its application to all of the cameras used by the Metro-Goldwyn-Mayer Studios.

This device facilitates camera operation by correlating the focusing of the shooting lens and finder lens and simultaneously correcting for parallax, with such precision that the position and sharpness of focus in the finder may be relied upon to indicate corresponding properties of the photographic image, thereby materially increasing the speed and accuracy of production photography, particularly in follow focus shots.

To: John Livadary, Director of Sound Recording for Columbia Pictures Corporation, for the application of the Bi-Planar Light Valve to motion picture sound recording.

The bi-planar light valve eliminates a serious form of electro-mechanical distortion caused by the striking together of the valve ribbons during the recording of high-amplitude modulations.

To: Thomas T. Moulton and the United Artists Sound Departments for the application to motion picture sound recording of volume indicators which have peak reading response and linear decibel scales.

This type of volume indicator portrays with greater accuracy the form factor of an electrical wave, and permits extension of the useable scale of volume indicating instruments.

To: The RCA Manufacturing Company, Inc., for the introduction of the modulated high-frequency method of determining optimum photographic processing conditions for variable width sound tracks.

To: Joseph E. Robbins and Paramount Pictures, Inc., for their exceptional application of acoustic principles to the sound proofing of gasoline generators and water pumps.

The application of advanced engineering principles to the sound insulation of generators and other accessory equipment has made possible the operation of these units at high efficiency, at points relatively close to the microphone, without noise interference.

To: Douglas Shearer and the Metro-Goldwyn-Mayer Sound Department for the design of the film drive mechanism as incorporated in the ERPI 1010 Reproducer.

This is an efficient means of obtaining a flutter-free film motion for use in studio recording and re-recording operations, the design of which was completed at Metro-Goldwyn-Mayer Studios.

SMPE Spring Sessions

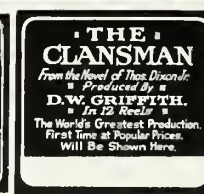
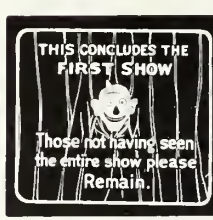
Feature color and sound in meetings at Washington, D. C., April 25th to 28th.

The Society of Motion Picture Engineers' 43rd semi-annual convention at the Wardman-Park Hotel, Washington, D. C., April 25th to 28th, will pay particular attention to color and sound recording and reproduction. Three sessions will be devoted to sound in all its phases and there will also be com-

GAGS



No business in the world is as full of oddities as the picture business. Above, George Teague's perambulator which allows actors to seem to be walking in projection background scenes. Left, a rain-storm ready made. Below, oldtime titles from the "flicker" days, and giving the rhino a touch of make-up.



plete sessions devoted to papers dealing with developments in photographic and laboratory processes; optics and projection developments; 16 mm. equipment; new apparatus; and educational and industrial motion pictures.

An informal luncheon will be held on the opening day at which Daniel C. Roper, Secretary of Commerce, Senator William G. McDoo of California, and Col. Dan I. Sultan, Engineer Commissioner for the District of Columbia will speak. The semi-annual convention banquet will be held Wednesday evening, April 27th, at which Dr. C. E. K. Mees, vice-president of Eastman Kodak, and other leading men of the industry will talk. Mrs. Franklin Delano Roosevelt will be hostess to the women attending on Monday afternoon at the White House. Special sightseeing trips are being arranged for members.

With the tremendous advance that has been made in motion picture film stock in recent months particular attention will be devoted to photography during which such papers as "Problems in the Use of Ultra Speed Negative Film," by P. H. Arnold, of the Agfa Ansco Corporation;



Corrections

Two important corrections on items in the March issue of *International Photographer* should be noted by readers.

In the advertisement of the Ruthenberg Color Company, 3x4 color prints from 16 mm. were listed at 95 cents. This should have read \$3.95.

In D. K. Allison's Laboratory Book of Tables, under Total Solids, instead of "Gms. Residue X 0.2," it should have read "Mgs. Residue X 20.0."

and "Characteristics of Supreme Panchromatic Negative," by A. W. Cook of the same company, and "The Determination of Correct Exposure in Photography," by L. A. Jones of the Eastman Kodak Company, will be presented.

On Monday evening H. E. Ives of Bell Telephone Laboratories will present a paper entitled "The Transmission of Motion Pictures Over a Coaxial Cable." Six paper will be presented on Tuesday on the subject of color, among which "The Theory of Color Reproduction," by A. C. Hardy of the Massachusetts Institute of Technology; and "The Multiplane Camera," by W. E. Garity of Walt Disney Productions, should be of particular interest.

During the two sessions on sound, recent developments in ultra-violet recording will be presented by G. L. Dimmich, L. T. Sachtleben and J. O. Baker of the RCA Manufacturing Company. H. G. Tasker of Universal will present a paper on "Multiple Channel Recording," and G. Friedl, Jr., of the International Projector Corporation will describe "A New Sound System." E. C. Manderfeld, Electrical Research Products, will describe a "Permanent Magnet Four-Ribbon Light Valve for Portable Push-Pull Recording," and G. R. Crane of the same company will present "Variable Matte Control (Squeeze Track) for Variable Density Recording." R. Vermeulen of Eindhoven, Holland, will describe "The Phillips-Miller Method of Sound Recording."

As is *INTERNATIONAL PHOTOGRAPHER*'s regular custom, abstracts of the papers presented and news and pictorial highlights of the S.M.P.E. sessions will be published in our May issue.

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1927 — 1938



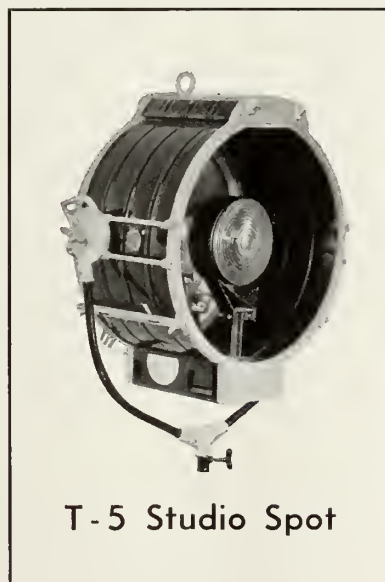
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Process

REAR PROJECTION BIG ADVANCE

Background projection pioneered by Teague, outstanding development of decade; new Motion Pictures Process Corp. enters background field, taking over Neumatz.

No other branch of motion picture production has evidenced such creative and technical initiative as the special effects and process departments. Since the early days of the industry workers in this field have consistently accomplished the "impossible" in the regular routine of doing their jobs.

While most of their work may consist of tricks, insofar as the finished product is something different than the action ac-

tually enacted before the camera, nevertheless this so-called trickery cannot be described as faking, because this one department of the industry has done more than any other to lift the motion picture as an entertainment medium from the photographing of virtual stage play action to a compelling art form.

Not only have the projection and trick departments made possible the most spectacular dramatic effects, but they also have

resulted in saving millions of dollars in the cost of production. One of the most stupid ideas ever broadcast about the motion picture industry is the belief in some quarters that projection process, trick and miniature work should be considered as an attempt to deceive the audiences.

There had been many types of processes and effects in use throughout the industry up to 1928, but the greatest progress shown in this field has been made since then.

The keystone of effect photography during the past ten years has been the projection background process popularly known as "rear projection." George

*Compliments
of a
Real Friend*

Teague, now head of the Universal studio process and special effects department, and also operating a manufacturing plant and process service under his own name, is generally credited with being the father of projection backgrounds, as they now are known, although a number of people contributed to the achievement of this process, namely Ned Mann, Frank Williams, L. S. Brainard, J. S. Dowley, Ralph Hammeras, Willis O'Brien, William Newman, William Matz, and Roy Davidson. The latter is now associated with Motion Pictures Process Corporation, Teague's principal competitor.

The first successful projection background photography of the modern type to be used in a major picture was in "Liliom," at Fox, in 1929, followed by its first big success in that company's spectacular music production, "Just Imagine." This pioneering was under Teague's direction.

Projection backgrounds were made possible during 1929 and 1930 by several important technical developments, including:

re during 1928-29.

(3) The development of the present super-efficient cellulose screen, now manufactured under a patent agreement between the Flat Light Screen Company and Warners-First National; these marvels of technical research overcame the "hot spot" that was the outstanding weakness of the ground glass in similar type projection background screens used in the early days of the process.

These factors, however, still would be



Above: George Teague, pioneer of projection background process photography, shooting a scene for Walter Wanger in 1936 at General Service Studio; and below a scene on the stage at RKO-Radio process department, headed by Verne Walker, made especially for International Photographer, with two grips posed in front of the transparent screen; and a blow-up from actual motion picture film of the composite shot.

(1) Perfection of the interlocking motor by Electrical Research Products, Inc.; this permitted the shutter of the camera to synchronize with the shutter of the projector, eliminating flicker in the projected backgrounds; previous experiments had encountered serious difficulties in synchronizing motors of both projector and camera, although prior to the interlock motor Willis O'Brien had had some success in operating both the projector and the camera from the same shaft.

(2) Introduction of high intensity projection lamps, pioneered by Clarence Ashcraft, for the Grandeur 70mm film, which passed into oblivion after creating a fu-

valueless had it not been for the trend of the motion picture industry in the previous decade toward precision equipment, pioneered by Bell & Howell. Regardless of other technical assets available, projection background photography would have been impossible—because of the absolute need for steadiness in the projector, camera and printer—had it not been for the adoption throughout the entire industry of the most minute standards of tolerance in the machining of parts for the precision instruments from camera to laboratory. Also of equal import-

ance was the development by the film manufacturers of emulsions with increased speed and finer grain which allowed satisfactory composite work that would have a realistic effect. Greater depth of field also was made possible through modern lenses and the faster emulsions by stopping down.

Laboratory work in developing and handling the process film requires unusually careful and rigid control. Frank Williams, whose organization pioneered in different process effects that preceded rear projection, now handles a majority



Persistent effort to secure realistic dramatic effects in motion picture with economy and without physical danger to the players is the objective of the special effects workers. Top, Ralph Hammeras in a miniature baryard. Center, snow scene in miniature. Right, a miniature landslide such as is used in earthquake scenes. Center, showing a miniature plane landing. Right, George Teague and his "rear projection" equipment; the picture is projected to the window which represents the side of a traveling train. Lower, showing how a glass shot is made. No. 1 left is the scene photographed from real life. No. 2 shows the painting and real life scene before they are correctly balanced, and No. 3 is the final scene as shown on the screen. Courtesy of Willis O'Brien and George Teague.

of this work, having built up a reputation for particular attention to process film handling.

Closely related to the work of these organizations is special effects and title work in which Ray Mercer, Consolidated Film Laboratory and Pacific Title are leaders. Mercer was one of the first to organize a special effects company serving all the studios and during his association with the late Max Handshegl in the late 20's in working on method of adding color to pictures that preceded our modern color systems, evolved many methods of handling effect and trick work. Mercer also specializes in miniatures combined with photographic action to give a realistic effect. He also does montage sequences for many pictures.

The immediate future of projection background process, with regard to improvements, lies in the direction of quieting the projectors in an attempt to match the silence of the modern new cameras

and the development of even more powerful illumination sources so that larger background images may be projected. Leaders in the process projection field believe that the problem of steadiness had been substantially solved.

Many are those who have contributed to progress in effects and in addition to the pioneering of Bell & Howell in precision design of equipment, such men as Paulis, Bill Rudolph, Harry Cunningham and Karl Thalhammer made important contributions. In photograph Irvin Willat, Victor Fleming and George Scott were known as pioneer specialists in trick photography. These early cameramen did many of their tricks in the camera. Willat generally is credited with the first multiple trick effects. The cleverness displayed by Willat and Fleming in this field won them promotion to the directorial ranks. Other important contributors to effects were Walter Hall at Paramount, with glass shots, and in the miniature field besides Mercer, Art Smith, Fred Jackman and Willat. Ferdinand Pinney Earle did outstanding pioneer

work in title backgrounds.

In the more advanced stages of special effects, Frank Williams, the Dunning and Roy Romero of Paramount, with their transparency system; Ned Mann; Rolla Flora; Mercer and Handshegl were outstanding specialists. During this period Lew Physioc, Frank Garbutt and Roy Klaffki were credited with making valuable contributions to laboratory efficiency in connection with trick work.

At the present time the leaders in the studio process departments are Bill Thomas and H. F. Koenekamp, Warner Brothers - First National; John Arnold and Arnold Gillespie at Metro-Goldwyn - Mayer; James Bassevi and Bob Layton, United Artists; Kit Carson and Emil Oster, Columbia; George Teague, Universal; Ralph and Ed Hammeras, F. M. Sersen and Rolla Flora, 20th

Century-Fox; Vern Walker and Lynn Dunn, RKO; Farciot Edouart, Paramount.

Projection background equipment dominance goes to two Hollywood organizations, those of George Teague and Motion Pictures Process Corporation, which took over the Neumatz organization recently. UFA in Germany and De Bri in France also manufacture projection process equipment. Two new entrants into the field are Mitchell Camera Corporation with a new projection head, announced last month, and International Projector Corporation, which is experimenting in an attempt to make the Geneva type movement practical for rear projection. Mitchell and International Projector demonstrated their equipment before an Academy Research Council meeting of studio special effects chiefs early in April at the RKO studio. Complete details of these new equipments and also of the new Teague and Motion Pictures Process Corporations' products and facilities will appear in the next three issues of International Photographer



During the past decade one picture was outstanding as an achievement in combining all types of special effects. It was RKO-Radio's 'King Kong.' This production, an expensive and lengthy capturing on film of an imaginative tale of a gigantic ape, was an outstanding technical and box office success. The studio's special effects department, which combines all effects units in one department, headed by Verne Walker, did an outstanding job, and a major contribution was the miniature process work of Willis O'Brien, noted for his work on a previous hit film of the same type, 'The Lost World.' Lower shots illustrate a matte effect.

Motion Pictures Process Corporation is a new organization, with Roy Davidson as technician in charge, which has taken over the Neumatz setup and will also expand into process service, both still and motion picture, in color and black-and-white. Davidson now is redesigning the Neumatz projector to modernize it, and the organization's new Hollywood headquarters is being rushed for opening early in May.



Motion Pictures Process Corp.



The latest and most highly developed equipment available for doing all types of composite photography, both motion picture and still, in either black-and-white or color.

We are also equipped to handle all forms of still photographic background process for studio photographers and for fashion, travel and similar branches of commercial and advertising art.

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We also are equipped to photograph background material in Hollywood or in any part of the world.

Motion Pictures Process Corporation personnel consists of men who have had many years experience in the process and composite field, men who have contributed to such impressive productions as "Lost Horizon," "Mr. Deeds Goes to Town," "It Happened One Night," "Hell's Angels" and many others.

Our new plant at 1117 North McCadden Place, in Hollywood, now is nearing completion and will be in full operation on or before May 15.

We use and are the exclusive agents for the Neumatz Process Projectors and we use the Flat Light screens in all composite work.

Estimates gladly furnished on all types of miniature and scale models and trick photography in general.



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Above, Jack McHenry, Francisco Universal newsman, greets Norman Alley on latter's return from Panay incident; Circle, Alley, with his DeVry Camera; Below, Old Glory and letters marked in mud identify newsreel camera car. Center,



News

ENTERPRISE

Addition of sound and "March of Time" influence outstanding in progress of newsreels; organizations and technicians in field tops in initiative.

The basic purpose of the newsreel has not changed much in the past ten years, but its importance and the attention to efficiency and rapid service to the nation's theatres, have been marked by great forward strides. During the same period, the interpretive treatment of news was developed by the editors of *Time*, patterning after their "March of Time" broadcast, to achieve sensational sales success and to win a special Academy award for outstanding contribution to screen progress.

The development of sound and the "March of Time" idea greatly influenced changes in format and format of news presentation on the screen. Commentators joined with the cameramen, soundmen and editors, and one comic commentator, Lew Lelch of Fox-Movietone, won great popularity.





Reels

the Panay, bombing of which created an international furor; Right, Norman Alley and another DeVry box; Circle, wounded Chinese soldier enjoys a smoke; and below, right, Art Merrellan, Norman Alley and Eric Mayell, of Morietone. Center oval, Joe Rucker and Alley.



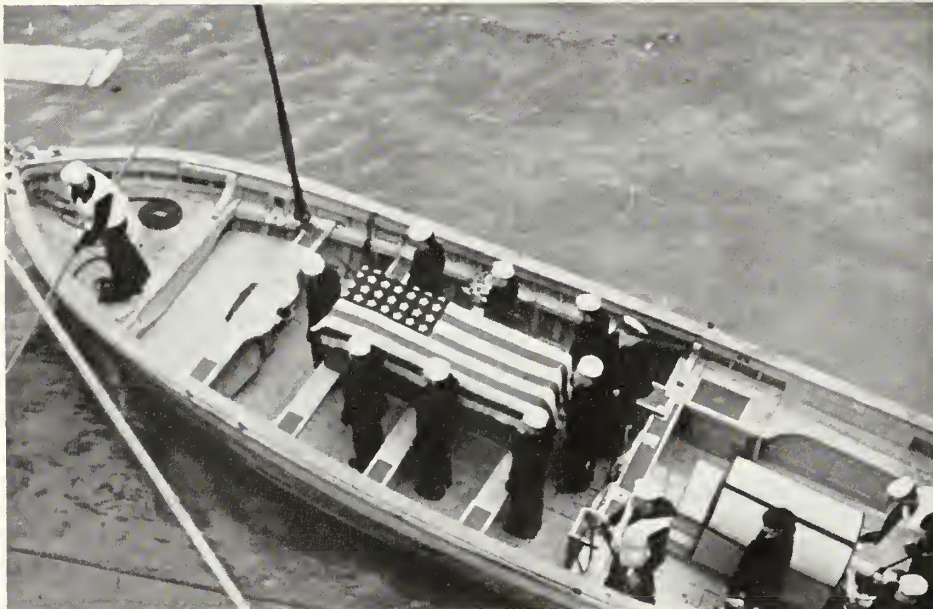
PERSONIFIED

Cocidental with the technical and showmanship and, came a period of sensational news development. One astounding news event followed the other, interwoven with the rise of the dictators in Italian states and the growing menace of another World War.

The Italo-Ethiopian struggle, the Spanish Civil War and the Sino-Japanese conflict, have been intelligently reported in celluloid by newsreel cameramen working out of different bases in the United States. News of the Day, Pathe, Paramount, Fox Movie and Universal all have established bases of operation. For example, on the Pacific Coast, Seattle, San Francisco and Los Angeles are considered bases. Incidents occurring at sea, off the Pacific Coast or land, up to the Chicago region from Canada to Mexico, are covered by newsreel cameramen stationed at one of the three bases. Thus the freelance man of lesser importance each day and more so because of the speedy train, the often-used plane and the modernized automobile that transports the newsreel cameramen at the rate of 80 and 90 miles per hour in emergencies.

At newsreel cameramen now are members of the



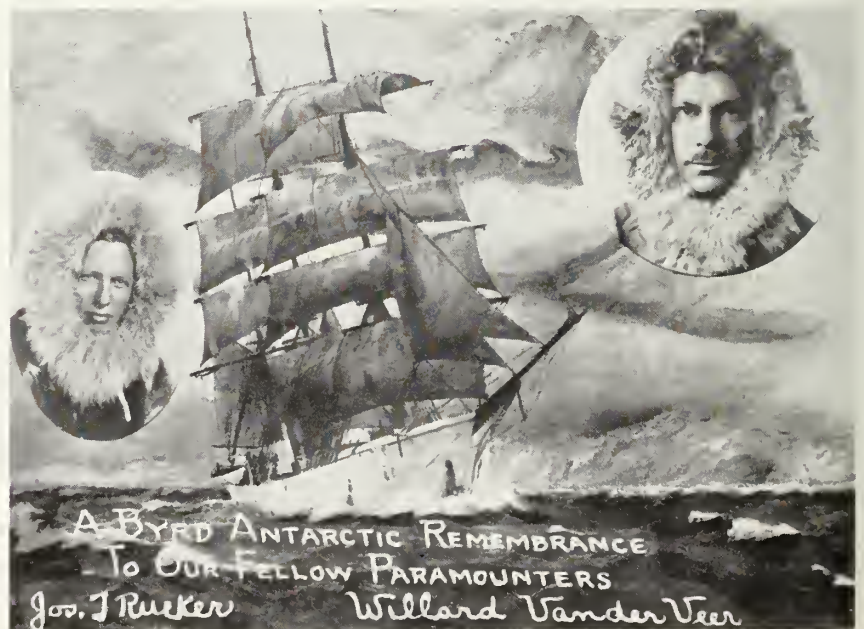


IATSE, with three important locals in the United States and one in Canada. Local 644, New York, with Charles Downs as business representative, takes care of the Eastern territory. Local 666 with William Stafford, business representative, handles middle western affairs and Local 659, with the writer as secretary, handles Pacific Coast affairs. The Toronto territory is covered by Local 665. An amicable relationship exists between all locals and as bitter as all newsreel cameramen may be in trying to out-scoop each other, they are steadfast and firm in upholding the traditional policy of the organization to which they have pledged themselves.

Even a casual study of the enterprise

burial services for Panay victims. Bottom, a tribute to the Paramount News photographers from their friends of the Byrd Antarctic Expedition.

Top left, fire on the Brooklyn waterfront was covered in June, 1917, by Charles L. Matthew, assignment editor of the then Hearst Pathe News (now assignment editor of "News of the Day") and Joe Johnson, now with Paramount News. The rare shot at top right was made at Chihuahua, Mexico, April, 1916, during the Mexican-U. S. embargo just before the World War. Man cranking Pothe Field model camera is Mexican Colonel. Cameraman Joe Johnson is standing alongside. Next is a Mexican General in charge of Chihuahua District, cranking a Universal camera belonging to Nick McDonald (wearing cap) of Selig-Tribune News. Next is Beverly Griffith, early motion picture figure, working for Universal Films. Next is Mr. Letcher, American Consul at Chihuahua, cranking a Prevo camera. Next to him is Gilbert Worrenton, now with Monogram. Next with a Prestwich camera (bare-headed) is Leland J. Burrod of Gaumont Weekly (now a well known Los Angeles realtor). Next, cranking a Moy camera is old-timer Tracey Mathewson, with Hearst Weekly. Bottom row, stooping, are newspaper correspondent. Center,



shown by the newsreel organizations from executives on down the line, will show that this branch of the industry is amazingly progressive. They are geared and organized for rapid-fire coverage of anything from a football game or a style show to a major war. And the rapidity with which they get the news beats on the theatre screens is even more amazing than the appearance of tomorrow's news on the streets tonight.

A veteran of the newsreel game is Joe Johnson of Paramount and I am indebted to him for the following account of the development of newsreels. I also am indebted to Al Brick, photographer, and William McGrath, soundman, of Fox Movietone for information in this story and in other articles in this anniversary issue of INTERNATIONAL PHOTOGRAPHER. Johnson's notes follow:

"To compare the newsreel of today with that of 25 years ago would be like comparing a modern newspaper with Poor Richard's Almanac, for then the 'News Weeklies,' as they were called, consisted mainly of parades, cornerstone layings and the like; news events of vital importance were the rare exception and not the rule. When the writer came to California in 1919, the reels still went in for apricot and walnut harvesting.

"The man most responsible for changing the newsreel for a 'filler' to a 'feature' was Emanuel Cohen of Paramount. He was the first to realize the importance of showing real news, human interest and occasional thrill subjects. Twenty years ago, the newsreel cameraman was considered a nuisance and many were the obstacles he had to overcome to gain en-

To the Hero of The Battle of Casa Blanca

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At Old Maria's Restaurant, June 8, 1914

Toastmaster, FREDERICK R. TOOMBS, The Noted Reformer

SPLANKERS

EARL HOOKER EATON, Director of the 39th St. Zoo

GEORGE F. MURRAY, President of Undertakers' Union

BOSS GLASS of World's Photographic News Service

E. TANNENBAUM, Ex-Mayor of Dublin, County Cork

MADAME JACKSON, St. Bartholomew's Pretty Girl Tenor

ADRIAN C. DUFF, The Casa Blanca Kid, Who Weighs In at the Bedside at 137 Pounds

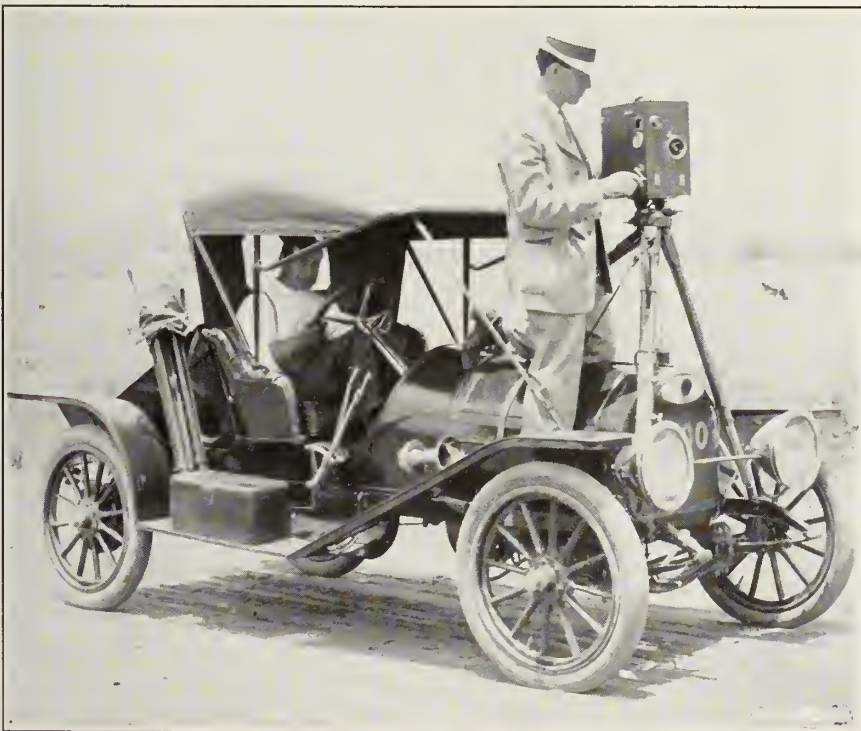
Championship Fight For "Feather" Title

RITCHEY RYAN, Inventor of "Chloroform Punch"

vs.

FRANKIE NEIL, The Assassin of the Pacific Coast

Singing, Vaudeville and Instrumental Music



One of the first news reels was "The Argus Weekly," organized in 1912 by Enrique Vallejo, Harry Revere, Dal Clauson and Bert Longnecker. Slogan was "The Argus Sees All." Headquarters was in two bungalows where the Talisman Studio now stands. Longnecker is driving the E.M.F. and Vallejo is grinding the Lumiere.

This picture was made in April, 1914, near Vera Cruz, Mexico, on railroad between Vera Cruz and El Tovar. It was shot at time of the occupation of Vera Cruz by the U. S. Army, Navy and Marines. Hand-car was stolen by cameramen for transportation. Top row, left to right; Jimmy Hare, photographer for Collier's Weekly. Joe Rucker, Universal Animated Weekly; bottom row: a N. Y. Tribune reporter, Adrian Duff of American Press Association, Wallace of Hearst Newsreel, and Wilbur Durbrough of N.E.A.

trance to places or obtain permission to shoot his story. Today, they beg him to come. One of the hardest jobs of the man on the desk is turn people down without offending them, when they want their 'event' covered by the newsreel.

"Of course the biggest change that came to the newsreel, the change that lifted it to the spotlight of national importance, came with the advent of sound, about 1929. Immediately more care and thought were given to both the taking and editing of the pictures. Interviews with people of world wide importance, such as the President of the United States, added immeasurable prestige and caused the newsreel to be a medium sought by those who were after publicity

—and the cameraman and soundman were welcomed everywhere with open arms. Today, the great majority of theatre patrons you may choose to question will tell you that to them, the newsreel is the best part of the show.

"Popular newsreels started in 1910 and Pathe was the first in the field—followed by a dozen others, a few of which have survived to the present day but most of them fell by the wayside. Some of the earlier efforts in the newsreel field were *Mutual Weekly*, *Gaumont's Weekly*, *Screen Telegram* and the *Selig-Tribune* which latter sprung up in 1915 sponsored by the *Chicago Tribune* and headed by Max Annenberg. All these died a natural death years ago. It is not generally known, but Paramount had a newsreel in 1915; they called it *Newsictures*; but that, too, was a short lived enterprise. Later *Selznick News* and *Kinograms* popped into the field for a short sojourn and Henry Ford started one which he abandoned after a few years trial.

"The business finally simmered down to the big five, which are still going strong—*Paramount*, *Fox*, *Pathe*, *Universal* and *Hearst*. The Hearst reel was the second in the field, starting about 1912 but it has operated under many nom de plumes in its 26 years of activity. Once it was known as the *Hearst-Selig News*; later it combined with Pathe and was called *Hearst-Pathe*. About one year ago the name of the Hearst reel was changed to *News of the Day* and it is still sailing under this banner.

"The modern cameraman would be amazed at the equipment used by the newsreeler of 25 years ago. Of course some of the old-timers around the studios used this equipment when they started in the game. The cameras in vogue at that

time were, principally, the Moy, Pathe field model, the Prestwich, Universal and Schustik. Joe Rucker had one called the Chronic, which was really a fine well balanced piece of machinery and Gus Johnson got some ideas from it which he embodied into the present Mitchell camera. Joe sold the Chronic in Japan about ten years ago. The Moy was an ungainly wooden box and looked more like a wardrobe, but the Pathe Field Model was a fine piece of work and this writer would like to have one of them right now. When the Akeley made its appearance about 1920, it was a deep mystery. An Akeley operator was 'some punkins,' believe you me, and I remember Archie Stout got double the salary paid at that time because he was an Akeley expert.

"One difficulty that newsreels had in the early days was caused by 'the framing of pictures.' Some cameras framed on the perforations and others framed between the perforations. Since the newsreels obtained their film from cameramen, who used various type cameras, the final make-up of the reel would embody all kinds of framing. This kept the theatre projectionist busy keeping the picture on the screen.

"In 1914, Pathe Weekly decided to start a 'Daily.' Each day, they would select their most important news event (some big parade or high school frolic) and print up one hundred foot length on non-flam film, which was mailed special delivery to theatres around the country. This burst of enterprise soon proved too costly, but it was a forerunner of the enterprise of today when we take a picture in Los Angeles today and show it on Broadway, New York, tomorrow night."

HERBERT ALLER.

Patents

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,110,496—SUBBING PHOTOGRAPHIC FILM. *George S. Babcock*, Rochester, N. Y., assignor by mesne assignments, to Eastman Kodak Co., Jersey City, N. J., a corporation of New Jersey. Application Feb. 26, 1936, Serial No. 65,873. 10 Claims. (Cl. 95-8)

A photographic element comprising a cellulose organic ester support, and in order thereon, a layer comprising a mixture of synthetic resin selected from the group consisting of polyvinyl resins and alkyd resins and a hydrolyzed cellulose organic ester, a gelatin layer,

and an emulsion layer.

No. 2,110,875—FILM FEEDING MECHANISM. *Arthur J. Holman*, East Orange, N. J. Application December 10, 1934, Serial No. 756,764. 10 Claims. (Cl. 271-2.3)

In a film feeding mechanism, a unit comprising two rotatably mounted sprockets, means for maintaining constant spacing between said sprockets, means for rotating said sprockets, and an idler supporting member common to and hingedly mounted between said sprockets.

No. 2,110,930—RECUPERATION OF VALUABLE METALS FROM PHOTOGRAPHIC

Georges Doffin, Cholet, France. Application Dec. 17, 1935, Serial No. 54,906. In France Dec. 20, 1934. 2 Claims. (Cl. 204-16)

A process for the electrolytic recovery of silver contained in photographic fixing baths, which comprises maintaining the tension between the electrodes at a value slightly below the critical value for which a silver deposit assumes a brownish colouring in an

electrolysis bath containing less than 0.1 gramme of silver per liter, this critical tension ranging between 0.3 and 0.5 volt.

No. 2,111,012—CAMERA SUPPORT. *Albert W. Tondreau*, Hollywood, Calif., assignor to United Research Corp., Long Island City, N. Y., a corporation of Delaware. Application Sept. 21, 1934, Serial No. 744,952. 5 Claims. (Cl. 248-183)

A camera free-head comprising a pair of axles on a rotatable base; a camera plate spring mounted on said axles.

No. 2,111,065—STEREOSCOPIC MOVING PICTURE DEVICE. *Victor Glanz*, Chicago, Ill. Application Oct. 12, 1935, Serial No. 44,649. 2 Claims. (Cl. 88-16.6)

A stereoscopic moving picture camera having a single lens in front of a moving film, a plurality of stationary reflectors spaced apart along a line perpendicular to the axis of the lens for reflecting images from spaced points into the lens, means for moving the camera in a cyclical path in the line of said reflected rays, and means having alternate light intercepting openings movable in timed relation with the exposures of the film to produce a multiplicity of line images on each exposure of the film.

No. 2,111,445—METHOD OF PRODUCING MOVING PICTURES OF THE STEREOSCOPIC VARIETY. *Edgar I. Fuller*, Dallas, Texas, assignor to Joiner Engineering Corporation, Dallas, Texas. Application May 20, 1935, Serial No. 22,462. 6 Claims. (Cl. 88-16.6)

The method of producing stereoscopic motion pictures which comprises forming two stereoscopic images of the scene from slightly spaced view points, recording the images separately and alternately on a film, forming a like series of images of the scene at a slightly different angle and recording said images alternately on the film, all of the images being taken at the same distance from the object but each at a different angle, and at a rate to provide persistence of vision, and projecting said images onto a screen and diffusing the projected image at the screen into small uniform alternately, laterally and forwardly spaced line elements.

No. 2,111,741—FILM GATE. *Frank E. Runge*, Oaklyn, N. J., assignor to Radio Corp. of America, a corporation of Delaware. Application Dec. 31, 1936, Serial No. 118,518. 1 Claim. (Cl. 88-17)

A pressure shoe for a film gate including a spring mounted plunger coacting with a slotted bracket for removably retaining said shoe in operative position.

No. 2,111,759—FILM DEVELOPING MACHINE. *William L. Douden*, New York, N. Y., assignor to Radio Corp. of America, a corporation of Delaware. Application Aug. 31, 1934, Serial No. 742,203. 6 Claims. (Cl. 95-94)

In a developing machine, a liquid receptacle, and a film treating chamber closed at its upper end and extending upwardly therefrom and adapted to contain a liquid maintained by atmospheric pressure, whereby film may be passed continuously through the region of reduced pressure at the upper end of said receptacle.

No. 2,111,806—UNITARY MOUNT FOR SOUND HEADS. *Ernest Ross*, Elmhurst, Long Island, and *Paul Haas*, Maspeth, Long Island, N. Y., assignors to United Research Corp., Long Island City, N. Y., a corporation of Delaware. Application Nov. 5, 1935, Serial No. 48,278. 7 Claims. (Cl. 179-100.3)

A film unit comprising the combination of a base plate, a flanged impedance roller mounted on said plate, a guide roller mounted on said plate at a predetermined position with respect to said impedance roller and adapted to urge film against the flange of said impedance roller, an aperture plate, a drive sprocket, and a film gate mounted on said base plate having pressure rollers co-operating with said impedance roller and said sprocket.

Sound



Shots on this page are of the General Service lot's portable sound truck.

SOUND PROBLEMS OVERCOME

Persistent research has extended frequency range, improved quality, given portability and simplified production methods; stereophonic sound prospect for near future.

Sound recording and reproduction is a subject upon which volumes could be written and quite a few have. There has been so much technical literature on the subject, that to attempt to resume developments during the past ten years in any thorough manner would be repetitious and would require more than the space available in this entire issue of INTERNATIONAL PHOTOGRAPHER.

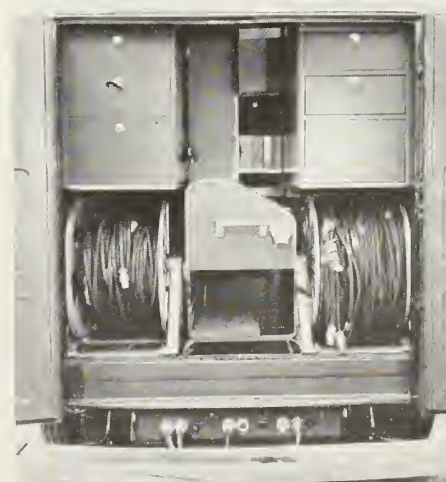
Unquestionably, the most important single development in the motion picture industry since its inception was the adoption of electrically recorded synchronized sound slightly more than ten years ago. This radical change had its effect on every department of production and

played a great part in the industry's technical departments switching from guesswork methods to scientific procedure.

Two principal objectives have occupied engineers since sound burst upon the silent picture industry. One was the goal of flexibility and portability of equipment so that the microphone would not restrict the camera from telling the story with the proper tempo and freedom of screen artistry. The other was the extension of the recordable range along with refinements in the quality and realistic value of sound in dialogue, music and incidental effects.

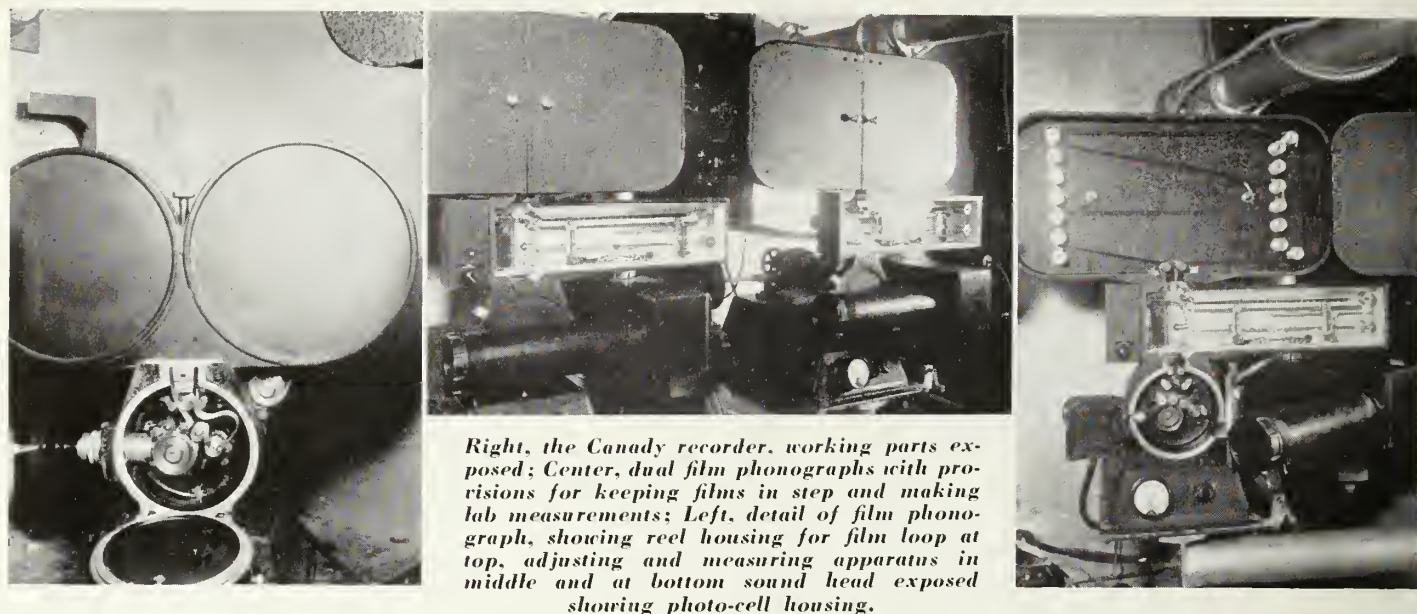
It can safely be said that in less than ten years, the army of experts from manufacturing company engineers to studio sound department technicians have worked the seemingly impossible. Studios today can record sound that is as near the goal of satisfactory results from an entertainment standpoint as was dreamed of in the late 20's; and although theatres are not yet equipped to handle the super sound, a definite campaign is under way to bring about a coordination between theatre equipment and the better type sound now possible.

Meanwhile, stereophonic sound has been demonstrated as practical and will be made available when theatre equip-



In the May Issue

D. K. Allison reports on a successful new system for improving the reproduction of high frequency sound recordings through pH control of the wash water. Tests were conducted in collaboration with the sound department of a major studio.



Right, the Canady recorder, working parts exposed; Center, dual film phonographs with provisions for keeping films in step and making lab measurements; Left, detail of film phonograph, showing reel housing for film loop at top, adjusting and measuring apparatus in middle and at bottom sound head exposed showing photo-cell housing.

ment generally is modernized to handle the push-pull type of recordings.

The present disparity between sound available and theatre practice is such that several months ago the Academy Research Council was forced to set up standard nomenclature and a system of designating Hi-Range and Lo-Range prints to avoid confusion. This was due to the fact that the modern sound frequently comes out of antiquated theatre equipment worse than the ordinary recordings.

Sound improvements have been so many and of such intricate technical detail that it is impossible to do much but sketch the highlights in commenting on the progress of the past ten years. Detailed accounts of sound progress are available in the back files of *INTERNATIONAL PHOTOGRAPHER* and the *S.M.P.E. Journal* and sound technique is brought up to date in the new volume on recording just published by the Academy's Research Council. (Rev. INT. PHOTOG., Jan., 1938.)

Major advances that recently have

brought recorded sound to a high stage of technical development include: push-pull recording, the Shearer two-way horn system, pre- and post-equalization methods, hill-and-dale in discs, RCA's ultraviolet recording and non-slip printer, high fidelity from both RCA and ERPI, multiple channel and re-dubbing.

The frequency range has been extended from the approximately 100-4500 of early sound days to 40-8000 and is constantly being extended.

Directional microphones, portable equipment, improved playback materials and methods, have permitted the soundman in the studios to cooperate to the fullest with the cameraman. All such work in the studios is done by members of Local 659, IATSE, under the existing basic agreement between the studios and the international unions.

ERPI and RCA still dominate the sound equipment field as they did at the start of sound, although RCA has made considerable inroads against ERPI's studio contacts. While a number of com-

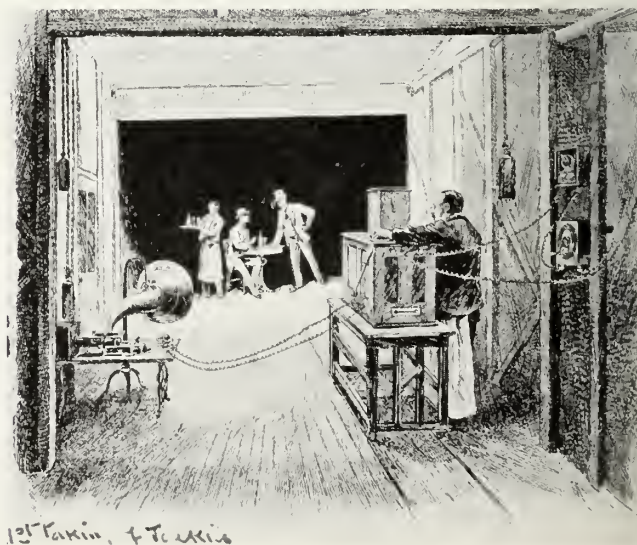
panies, including Bell & Howell and DeVry, with newsreel and 16 mm., Eastman, Ampro, Balsley & Phillips and similar firms are concentrating on the sub-standard field, which has swept to increasing importance with the recent emphasis on visual education and the use of film for sales and promotion. Art Reeves in Hollywood and the Canady organization of Cleveland are the outstanding firms among the independents. Mitchell Camera Company also is entering the recording field.

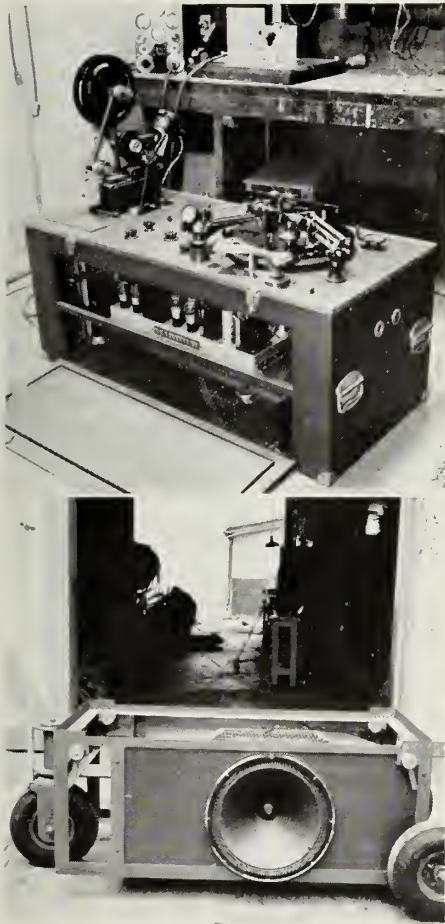
Reeves and Mitchell are well known to readers of *INTERNATIONAL PHOTOGRAPHER* over the past ten years, while Canady only recently started exploiting his products through this medium. Both Reeves and Canady are veteran "I. A." men.

Canady is the only producer of sound-on-film equipment who actually manufactures recorders, re-recorders, recording lamps, etc., so as to provide a complete service. The Canady DeLuxe recorder has been furnished for either 35 mm. or



Above, Amet's talking device, 1911-1917, with photograph of Mr. and Mrs. Amet at Redondo in 1912. The palm trees shown in the picture are now 30 feet in height. Note the microphone of those days and camera that recorded sound picture simultaneously. Right, from Dickson's "History of the Kinetophone," published in 1895, showing the Edison Talkie, being recorded before 1895.





Above, the RCA playback console, in use at Warners-First National. Left, the ERPI playback unit, and below, the portable special dolly for playback with underslung loud speaker.

16 mm. work but due to increased interest in 16 mm. use, a new recorder built especially for 16 mm. work will be available this month.

The new Noise Reduction Unit ("Noiseless Recording") announced by the company in this issue is the result of several years work. The unit can be

used with any existing equipment without rebuilding amplifiers. All glow lamp equipment can be brought up to date and can produce sound with a minimum of background noise by the addition of this unit. It is fully protected by Canady patents.

The only industry in which the rapidity of technical and artistic change compares with the motion picture industry is radio. In fact, it seems that radio may have

moved farther during the last ten years than has the picture industry. Ten years ago the movies were wordless but at least there were movies, while radio broadcasting was just creeping out of the experimental stage.

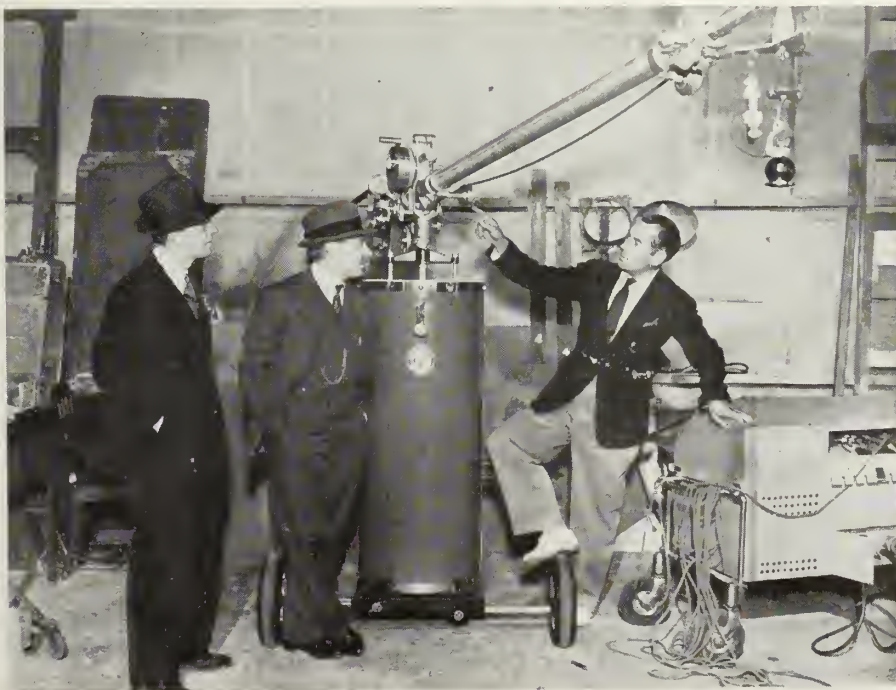
The average radio receiver of ten years ago was a massive and expensive thing, generally operated by bothersome and leaky batteries capable of reproducing music barely recognizable as such. Chain broadcasts were practically non-existent and such radio advertising as existed was almost entirely local in character and entirely lacking in the showmanship that surrounds most of the commercial plugs on the air today.

High-powered stations on cleared channels were just being thought of ten years ago and anyone living more than 50 miles or so from a station could not count on enough signal to have any real entertainment from radio.

Set manufacturers were busy arguing whether a decent receiver could be built and sold for less than \$100; but most popular sets sold from \$175 to \$300. The big names in the radio field were Kolster, Fada, Grebe, Majestic, Silver-Marshall, Sky Raider, Remler, Stromberg-Carlson, Sparton, Kellogg and RCA. A tiny firm in Philadelphia were trying to sell a gadget called the "Transitone" radio for use in a motor car. The first ones were only meant for use when the car was standing still as ignition noise drowned out the feeble signals when the motor was running.

The technical advances made in the art of radio and particularly broadcast communication during the last ten years are nearly as marvelous as radio itself.

Ten years ago a high fidelity broadcast transmitter had a frequency response range from about 100 cycles to 4000



Soundman Walter Oberst explains Mole-Richardson light mike and perambulator to Director Alexander Hall and Charles Ruggles.

cycles per second. They were capable of about 50 per cent distortionless modulation (sic) and the high ground noise and hum on the carrier limited the usable volume range to about 20 decibels. Today a modern broadcast transmitter has a flat frequency response from about 40 to 8000 cycles per second, the modulation capability is pretty linear to about 90 or 95 per cent modulation and the ground noise on the carrier is close to 50 decibels below 100 per cent modulation. To average ears this type of reproduction could rarely be distinguished from the original if the broadcast receivers were as good as present day broadcast transmitters. However, while the receivers have been materially improved they still are behind the transmitters in quality of reproduction.

Television existed ten years ago in the laboratory but scanning methods were crude and the reproduced pictures had very low detail and definition. Television today still is in the laboratory but it is much farther advanced now than radio broadcasting was ten years ago. Pictures of quality, brilliance and size comparable to good 16 mm. home movies are now practical—if someone can be found to pay for them. The names of Farnsworth and Zworykin, and perhaps duMont, will be remembered as the great developers of television. Any mention of television without mentioning the field of facsimile transmission would be very unfair to the newspaper of the future. A very short time should see a cheap attachment to present radios, utilizing the radio equipment during the night hours from midnight on for printing a facsimile newspaper to be ready and complete with ads, cartoons and halftones by daylight next morning. Very few problems remain to be licked in the facsimile field and several broadcast stations are now installing transmission equipment for this purpose.

The future of television naturally is difficult to forecast. However, several rather radical simplifications of the equipment and transmission medium are bound to appear as soon as enough smart young minds start playing with the problem. Chain television programs are rather far off right now, and the use of motion picture film, rather than wire lines, will probably serve to make program talent available to the whole nation.

While television will obviously compete with motion pictures as a way to spend an evening, it will also help the picture business in offering a perfect means for plugging new pictures and new personalities. Television will draw extensively on motion picture technical and dramatic talent as the problems involved in staging a television show will be very similar to those of motion picture production. The smart motion picture producers will get in early and avoid the rush for station licenses, technical

talent and patents because there are only so many television channels available. When these are gone there will be no more.

New York and Los Angeles will be the first and foremost centers of television activity for some time to come for technical, artistic and financial reasons.

Television can expect its share of fly-by-night promoters and many headaches are lying in wait for those who jump in blindly hoping to make a million overnight. The motion picture industry might take a leaf from the book of the Don Lee Broadcasting System, which has been quietly and rather inexpensively experimenting with various television systems for several years and has actually been broadcasting television programs so that when commercial television frequencies are finally allocated by the Federal Communications Commission they can justifiably apply for choice of the available channels.

At the present state of the art there is only room in the ether for about six television stations in the Los Angeles area, and as NBC, Columbia and Don Lee are certain to account for three of these some-one is obviously going to be left out.

Meanwhile, with Hollywood assuming a dominant position second only to New York as a major network program source, Columbia Broadcasting System is nearing completion of a modern headquarters on the site of the old Christie studio at Gower and Sunset, while National Broadcasting is rushing construction on the site of the old Paramount lot at Vine and Sunset. Technical details of Hollywood's new "Radio City" will appear in early issues of INTERNATIONAL PHOTOGRAPHER.

J. N. A. HAWKINS, 695, IATSE

New ARC Report

After 18 months of tests and research, Sound Projection Equipment Standards Committee makes recommendations.

The Academy Research Council early in April sent the report of its Committee on Standardization of Theatre Sound Projection Equipment Characteristics to engineering departments of each of the companies participating in the Council's cooperative technical program. The report contains recommendations covering the various parts of the theatre reproducing system, resulting from approximately 18 months of tests and experimental work by the Committee.

Appointed by the Council in November, 1936, the Committee, under the chairmanship of John Hilliard of MGM set out to prepare standards and specifications for theatre sound equipments which will permit the best possible re-

production under general operating conditions of the recordings of all studios in all theatres, regardless of the type or manufacture of the sound reproducing equipment.

The specifications and recommendations contained in the report have been prepared for the guidance of the engineering departments of the producing companies participating in the Research Council cooperative technical program, and the engineering departments of the associated companies affiliated with these producing companies, in purchasing new sound projection equipment.

Copies have been distributed through each company's representative on the Council to the proper officials of each producing company.

Copies are also available upon request to all sound equipment manufacturers, to be used as a guide in designing, testing, or manufacturing new equipment, or to theatre servicing organizations and exhibitors who may be interested in the opinions of the Council on sound reproducing equipment.

The Committee installed several complete reproducing equipments in the Filmarte in Hollywood where, through cooperation of Fox-West Coast Theatres, a series of experimental tests were conducted on each of these equipments under identical operating conditions.

Two sub-committees were appointed to assist the Standardization Committee; one, a Horn Test Steering Sub-committee under the chairmanship of Homer Tasker and consisting of John Hilliard, Don Loye, William A. Mueller and Wallace V. Wolfe, which drew up all of the test plans, and the other a Test Operating Sub-committee consisting of John Hilliard, Chairman, John Aalberg, Lawrence Aicholtz, Lloyd Goldsmith, Don Loye, K. F. Morgan, Gordon Sawyer, William Thayer, S. J. Twining, John Volkman, Samuel A. Waite and Wallace V. Wolfe, which actually conducted all of the tests from which the conclusions in the attached report were drawn.

In addition to producing companies and Fox West Coast Theatres, Electrical Research Products, Inc., RCA Manufacturing Company, International Projector Corporation and the Ashcraft Lamp Company all cooperated in the test program.

The Committee's report is divided into six parts and contains general recommendations on each of the following classifications:

The Sound Head and Associated Equipment.

Volume Control Equipment.

Amplifiers and Filters.

Loud-Speakers and Dividing Networks.

Studio and Preview Theatre Requirements.

Details of the report will be published in next month's INTERNATIONAL PHOTOGRAPHER along with comment from various authorities on the proposals.

Lighting



Two jumps in the march of progress to the present effective and artistic lighting technique. At left, the Jesse Lasky studio, about 1914, using the overhead diffusing screens, when nat-



ural light was California's big talking point; at right, 1934, twenty years later, a scene at Paramount from the Bing Crosby-Carole Lombard musical, "We're Not Dressing."

PAN AND SOUND PUT INKIES ON TOP

Mole-Richardson and Bardwell & McAlister dominate in studio lighting equipment field; General Electric and National Carbon make vital contributions.

Ten years ago motion picture lighting was in the midst of a revolution. A new light-source—the incandescent filament globe—was displacing arc and vapor-tube illuminants which for two decades had been supreme.

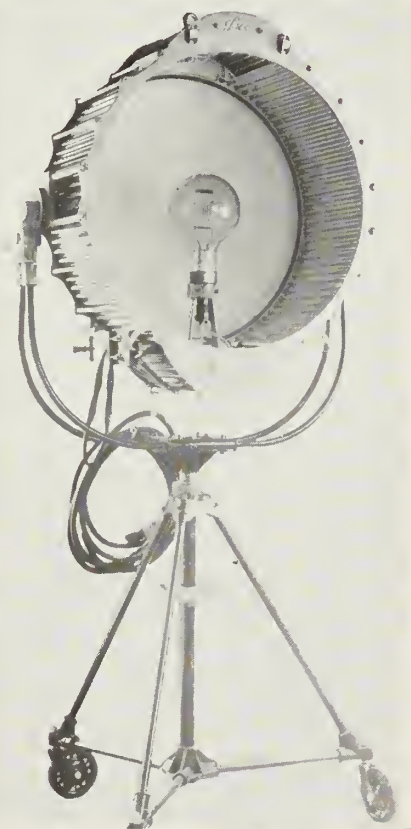
It has often been implied that this change was brought about by the coming of sound, and its attendant need for silent sets, but sound merely influenced and accelerated the change, and was not its primary cause. Actual cause was the popularization of panchromatic film, which took place some time before Al Jolson met the Vitaphone. The bluer light of the earlier illuminants was excellent for use with the strongly blue-sensitive orthochromatic emulsions which had little sensitivity to yellow and none to red. With the coming of panchromatic film—sensitized also to yellow and red—the warmer radiation of the Mazda globe became a distinct asset.

Even before panchromatic had proved itself for major production use, a few forward-looking cinematographers and engineers had essayed experiments with incandescent lighting. Most of these early experiments, however, remained merely

experiments because there were neither globes of adequate power nor lamps in which to employ them for motion picture lighting.

Outstanding pioneer experimenters were Peter Mole and Elmer Richardson, at that time in the employ of one of the leading manufacturers of arc lighting equipment. They had the vision to see the handwriting on the wall as panchromatic film made its initial bow. They interpreted it, moreover, into an inevitable need for incandescent studio lighting equipment. Urging such research they were met with the attitude typical of many of the more conservative minds of the day: that the arc was the one light-source ideally suited to motion picture lighting, and that money spent experimentally with any other illuminant—especially Mazda globes—would be wasted.

Far from accepting this dictum, Mole and Richardson had such confidence in the inevitability of Mazda lighting that they resigned their positions and joined forces, forming a new firm under the name Mole-Richardson Company. It is significant that none of the firms which a decade ago dominated the studio light-



The Laco incandescent lamp, which was popular in the studios during the first part of the past decade. Lamp shown above was featured in 1931.

Two Bardwell & McAlister inkies. At left is the 2000-watt Keg-lite Spot and at the right the popular T-5 Studio Spot.



other enterprising firm, Bardwell & McAlister, but a few years old, as a leading competitor.

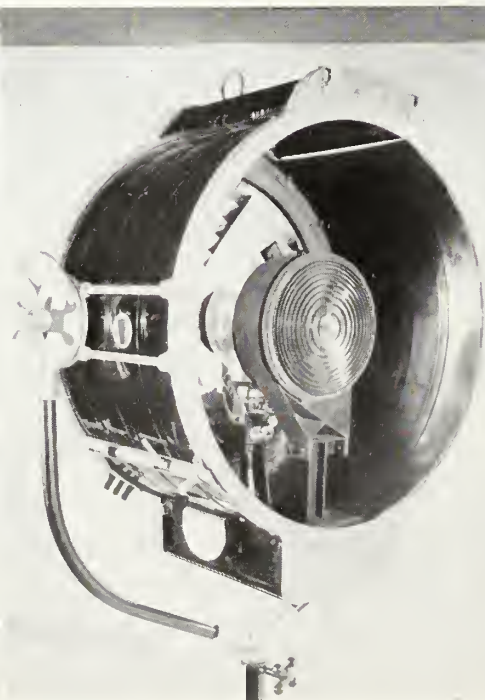
The first incandescent unit developed commercially was one analogous to the arc broadside universally employed for "general" and "filler" lighting. These first "inkie" broadsides borrowed much from arc practice. Reflectors surprisingly like those used for arc broadsides housed, in these earliest designs (MR Types 19 and 20) first one and then two 1000-watt tubular projection-type incandescent globes. These produced a wide flood of light of adequate intensity and fairly satisfactory distribution. Cooling these tubular globes in the relatively restricted space of the lamp-housing proved a considerable problem, and the higher working temperatures seriously affected the burning life of the globe.

These units, however, pointed the way to the possibilities of incandescent lighting, and brought the globe-design engineers of the General Electric Company's lamp division into consultation on the problem of making globes suited to studio use. The tubular globes soon were supplanted by the now familiar pear-shaped globes of 1000 and 1500 watt capacity.

ing field remains active in that field today, with the exception of Art Reeves and Otto K. Oleson, whose lighting equipment is secondary to other products, while the Mole-Richardson organization has grown to recognized international leadership in studio lighting, with an-

The next units to appear were a range of condensing-lens spotlights built around incandescent globes of 1000 and 2000 watts (MR Types 35 and 25, respectively), and somewhat later, the first "Baby Spot" (MR Type 129) which used a 500 watt globe. Viewed in comparison to

the arc spotlighting units of the day these first "inkie" spotlights were a revelation in the simplicity of their operation and in the smooth, flickerless beams they projected. Cameramen speedily discovered that incandescent lighting could be enormously flattering to the stars.



Trucking up on T-5 Spot to show construction of auxiliary optical system.



At about the same time, a new and better unit for general lighting was evolved. At the time, it seemed little short of revolutionary, though today it has so completely superseded the incandescent broadside for general lighting that it has become a familiar commonplace. This unit was the "Rifle Lamp" (MR Type 211). It used a single, pear-shaped globe of 1000 or 1500 watts, which was burned in a horizontal position. The reflector was a deep, bowl-shaped shell into which was fitted a glass mirror imprinted with a special pattern of spiral corrugations suggestive of the rifling of a gun, from which the unit derived its name.

Outstanding advantages of the "Rifle" lay in the fact that it projected its smooth, soft flood of light over an angle of 60 degrees both horizontally and vertically, thereby overcoming a weakness of the early broadsides, which illuminated a shallow vertical angle and often failed to illuminate adequately the lower parts of the foreground. The "Rifle" lamp has remained unchanged for nearly a decade; only modifications in the design being structural improvements and substitution of a metallic reflector for the somewhat fragile glass one. The present, modern-

Two Mole-Richardson inkies. At left a "H.I. Arc," very valuable for color photography; and at right, the M-R 5KW Senior Solarspot.

ized "Rifle" (officially MR Type 45) has become one of the most widely employed lighting units in the world.

Following this development, the "inkie" range was extended by the introduction of a series of high-power, reflecting spotlights. These served much the same purpose as the famous "Sun Arcs," and were accordingly called "Sun Spots." They were made with 18, 24 and 36 inch mirrors, using 2000 watt, 5000 watt and 10,000 watt globes especially developed for the purpose. They were known as MR Types 220, 226 and 360, respectively.

These incandescents were evolved at the psychological moment. As incandescent lighting equipment became available, first one and then another cinematographer decided to take the risk of filming a full production on panchromatic film, and only one firm—Mole-Richardson—had developed incandescent lamps suitable for studio use.

Cameramen and electricians throughout the studios ranged themselves into two camps, for or against the new lighting system. Finally, during the winter of 1927-28, the industry as a whole through the Academy Research Council cooperated in putting the new film and lamps to systematic tests, as nearly as possible under service conditions. Producers donated studio space and current; film manufacturers donated film; cameramen and other technicians donated their time in a memorable series of tests which ultimately convinced the industry that the new light was technically and artistically superior, and actual production indicated that it offered substantial economies, as well. In a paper presented at a convention of the Society of Motion Picture Engineers soon after, it was remarked that in comparison with the normal use of arcs at that time, the cost of incandescent equipment represented a saving of almost 55 per cent; operation, a saving of nearly 58 per cent; and in current used, an economy of close to 65 per cent.

These facts alone, when added to the more pleasing results obtained on panchromatic film with incandescent lighting, would in time have brought about a complete change of lighting equipment. But at this juncture came sound, to accelerate the change.

The sound technique of those days demanded quiet sets and, in addition, often involved extremely long "takes" during which the illumination must be free from flicker. The only lighting units available to meet these demands were the new "inkies." Inevitably every studio as it changed from silent to talking pictures, changed also from arc to incandescent lighting.



For the next several years the chief problem of the lamp manufacturers was that of filling the industry's demand for inkies. Detail modifications were made in the lamps as practical experience indicated possible advances. Constructing lamp housings largely of aluminum castings and of metal parts all of which had the same factor of expansion served to eliminate the previously unimportant crackling noises made as lamps warmed and cooled. The use of faceted ("aplanatic") metal reflectors in the mirror spotlights somewhat improved the distribution of light as the beams were flooded. "Spill rings" minimized the problem of "spilled light" from the mirror-projectors, allowing only projected—and therefore controlled—light to pass.

During this period, too, a considerable variety of special-purpose lamps were developed, generally to solve a specific problem of some individual cameraman on a particular production. Among these was the familiar "Lupe," which proved so successful it became a standard part of the Mole-Richardson line under the name "Handilamp" (MR Type 127). Another was the "Sky Pan," evolved at the request of a cameraman faced with the problem of lighting unusually large backings. The "Cinelite" and "Photolite"



Above, two products from Beattie's Hollywood Hi-Lite division of Otto K. Oleson. Left, Boon-lite, flexible source of light for portrait photography; right, Hi-Key 1000-watt Spotlight. Below are the Mole-Richardson Junior and Senior Solarspots.



were developed for industrial filming, where portable lighting equipment was needed.

Other developments, not so intimately connected with lighting, included microphone booms, camera dollies and rolling tripods, silent wind-machines and the like, while in the field of auxiliary electrical equipment may be mentioned remote-control panels and dimmers for controlling lights, and portable, gasoline-powered electric generators for generating current for location use. Some of the



Bardwell & McAlister's 2000-watt Keg-lite.

latest of these generators provide enough current to light and power a town of 2500 population, yet fit compactly on a single motor truck.

During the period of the depression, the research facilities of the Mole-Richardson organization concentrated on the problem of developing a new type of lamp which would be free from the faults inherent to the conventional parabolic-mirror Sun Spots. These latter units were efficient only when their beams were concentrated in a tight spot; thereafter, as the beam was flooded, the inescapable characteristics of the parabolic mirror created an increasingly large shadow in the center of the beam, surrounded by a ring of intense illumination, sometimes 300 per cent stronger than the central portion of the beam.

The solution was ultimately found in the Fresnel or echelon type of lens, a condensing lens of large diameter (or high speed) in which the surfaces were rearranged in the form of concentric, lenticular circles, eliminating excess thickness and minimizing breakage risks. A special lens of this design was finally developed and became known as the "Morinc" lens.

The first unit utilizing this lens was introduced in the spring of 1935 and was named the "Junior Solarspot" (MR Type 210). It utilized a 2000 watt globe, and formed its beam by means of the "Morinc" lens and a small auxiliary spherical mirror which reflected the rear-ward rays from the globe forward through the lens. Radically different from any previous lamps in appearance, it was equally different in performance. The distribution of light within the beam was smooth at all beam-spreads, while the range of divergences was greatly in excess of any-

Arc lamps came back into popularity with the improvement and revival of Technicolor in three colors during the past four years. This shot from Samuel Goldwyn's "Kid Millions," starring Eddie Cantor, saw the assembling of a huge battery of arcs to light the spectacular Ice Cream fantasy sequence.



thing possible with the older mirror spotlights, from a tight spot-beam of less than eight degrees divergence to a flooded spread of 45 degrees.

Similar units of both larger and smaller capacity followed. These include the 5000 watt "Senior Solarspot" (MR Type 214), a 1000 watt Solarspot (MR Type 208) and a "Baby Solarspot" (MR Type 206) of 500 watts.

Coincident with this development, and paralleling it, was a program of special research undertaken in collaboration with the National Carbon Company's experts for the Technicolor Motion Picture Company. When the present three-color Technicolor process was brought forth, it was found necessary that adequate lighting equipment be available for it. A fundamental problem of any system of natural-color photography is that of the color of light illuminating the subject. If the process is to achieve commercial flexibility, it must be possible to use the same cameras, without adjustment, for both exteriors filmed by natural light and interiors filmed by artificial light. The light used for the interior scenes must therefore be of a color closely matching the "white light" standard of normal daylight.

Due to their high yellow, red and infra-red radiation, the usual incandescent lamps cannot be used for this purpose without the application of corrective filters which absorb considerable light. Moreover, for the early requirements of the Technicolor process, higher levels of illumination were necessary than could be supplied by the incandescent units available.

It was determined to standardize on arc lighting for Technicolor photography. The first units developed were "Side Arcs" (MR Type 27) and "Scoops" (MR Type 29) for general lighting. These lamps were immense improvements over any previous units of their types. They are twin-arc units, using special carbons which emit radiation almost perfectly matched to the daylight standard. Their mechanisms are such that they burn noiselessly, and with virtually no flicker. They burn steadily for long periods with a minimum of attention, and produce 250 per cent more light than previous twin-arc broadsides.

The next unit was a high-intensity arc spotlight based on the same optical principles as the incandescent "Solarspot," and known as the "H.I. Arc" (MR Type 90). It is a high-intensity, rotary carbon arc spotlight operating at 120 amperes, which burns silently and steadily, and casts the same smooth beam as the Solarspot. A larger unit, the 150-ampere "Ultra H.I. Arc" (MR Type 170), followed. A still larger unit was designed but, due to improvements in the Technicolor process which greatly reduced the amount of light needed, was never built. The final lamp in this series was a relatively small spotlight of 65 amperes (MR Type 65) which completed the necessary range. All of these high-intensity arc units radiate light slightly more blue than is desirable for natural-color photography and are accordingly used with a very light straw-colored gelatine filter which corrects their light to the daylight standard.

These units are used exclusively on all

Technicolor productions, wherever made, and to an increasing extent the "H.I. Arcs" are finding application in monochrome cinematography as well. In this latter field they are used for the production of sunlight effects and strongly-defined shadows. Of late some use has been made of incandescent units—chiefly Solarspot—in Technicolor photography. For this usage the General Electric Company has developed special high filament-temperature globes in various wattages. They are in principle similar to the familiar photoflood globes, and are designated as "C.P." (color photography) type globes. Used without any corrective filter, these units are employed for lamp-light, torchlight, firelight and other warm-toned effects. With the special blue corrective filters they are used for normal effects in positions where it may not be convenient to place an arc.

With all this, the Mole-Richardson Company, "inkie" pioneers, has expanded to serve virtually every important production center. Agencies are active in New York, Cairo, Egypt, and Bombay, India, while affiliated companies manufacture Mole-Richardson products under license in England and now also in France. It is a significant fact that the factory of Mole-Richardson (England), Ltd., is almost double the size of the plant which housed the parent company at its inception in 1927.

It is also significant that all of the firms supplying lighting equipment to the American studios have been located in Hollywood rather than elsewhere. Chief among the other firms manufacturing studio lighting equipment, and practically

the only one still active, is the Bardwell-McAlister group which has within the past year introduced a 2000 watt spotlight, the "Keg-lite," which utilizes the echelon-lens principle. Bardwell-McAlister has also developed a series of parabolic-mirror spotlights in which a small echelon-type lens is used in place of the conventional "spill ring," thereby adding considerably to the flexibility of this type of equipment. Among the other firms which have been in this field during the past ten years may be mentioned also the "Laco" and "Arro" organizations.

The firm of Bardwell & McAlister, Inc. was originally organized for the purpose of supplying generators to the studios. In 1935, seeing the need for better equipment, they expanded into the business of manufacturing and renting motion picture electrical and lighting equipment. During these few years this firm has adopted many new and progressive ideas in design of their equipment, striving to cut time of placing and operating equipment on the set where minutes mean dollars.

Among the first pieces to be pioneered was the Zephyr Wind Machine, a silent machine of sufficient power and flexibility to be especially adaptable for use on inside sets. Its mechanism employs the Sirrocco blower instead of the conventional aeroplane type propeller. A convenience of this type of blower is the practicability of using ducts to pipe the wind to remote parts of the set or at any place away from the machine.

Following this came a new and revolutionary addition to the incandescent class, the Triple-5 Studio Spot. This lamp, same size and shape as the 24-inch sun spot, employs a Fresnel type lens before the globe in place of the spill ring. The lens projects light formerly shielded off as waste, into the field where it supplements the light from the 24-inch mirror located behind the globe. A differential focusing screw keeps the globe and lens in proper focal relation at all spreads. The lamp gives an even field of light devoid of dark spots, shadows, or hot rings, and possesses an intensity more than double that received from the old 24-inch sun spot with spill ring. Old style 24s can easily be converted into T-5s by the addition of the necessary parts. Hence a studio may equip itself with these up-to-date lamps by modernizing rather than obsoleting their present 24s. The T-5 has proven very popular with the motion picture industry, not only for its greater light output, but for the smoothness of the field, with no time being lost on the set balancing out shadows and hot rings.

Almost simultaneously a new Fresnel type lens was developed, called by one of its characteristics, "Leak-Proof" lens. As the name implies, this lens gives no side spill light. This startling result is accomplished by especially processing the under sides of the prisms in the manufacture of

the lens. This lens is used in the T-5 and also in the Keg-Lite, a 2000 watt unit which is ideal for key lighting and other critical places where the absence of spill light is essential. Embodied in this lamp is the new patented quick focusing device, which eliminates the old screw focus. This enables the operator to change the intensity or follow a figure during a scene quickly and smoothly.

In addition to the above, Bardwell & McAlister, Inc. carry and manufacture a complete line of generators, cable, spiders, power wind machines, and other electrical equipment demanded by the studios.

The basic technique of lighting has changed remarkably little during these ten years of equipment progress. As faster film and better lamps appeared, there has been a marked tendency to reduce the amount of light used. The most noteworthy change has been the development of the so-called "key lighting" technique. This has almost completely eliminated the maze of general or floodlighting units which formerly encumbered stage floors. Instead, a relatively few units, placed rather high, and usually positioned beside the camera, take care of the principal or "key" lighting of the players, while the burden of light-

ing set and players is carried by spotlights on the lamprails above the set. This is largely a result of the moving-camera technique, for it was early learned that the old method of lighting from the floor not only interfered with the camera's movement but gave rise to undesirable shadows as the camera-angle changed. A further development of this technique is the increasing use of dimmers on individual lamps and groups of a few lamps, to control the light accurately as either players or camera move about the set.

The effect on lighting technique of the new, super-fast films recently introduced by Agfa cannot be clearly established as yet. However, it seems most probable that the effect will not, except in rare instances, be any sweeping reduction in lighting, but rather a slight reduction in lighting combined with a considerable reduction in lens apertures to effect better photographic quality, greater depth of focus and improved definition. It is generally conceded that the present lighting technique has reduced to the minimum the number of angles of lighting employed, and that further reductions in lighting will not be achieved by reducing the number of lamps used, but by reducing the size and wattage of the units.

Make-Up

NOW AN EXACT ART

Modern make-up materials and technique are keyed to the progress made in other departments of production through switch from greasepaint to panchromatic.

With many varying changes of light, camera, and film, it has by the same token been necessary for many definite changes to be made in the art of make-up in material, in application, and in execution during the past decade.

Ten years ago the industry was using orthochromatic film, with which it was necessary for the make-up artist to use the heavy stick make-up made by Stein, Lechner, Warnerson, Meyer, Lockwood, and

Plucker & Aarons. These grease paints were of a heavy consistency and were applied by first using some emollient substance on the face usually cold cream and then by rubbing the stick on the face applying a heavy-mask-like surface. This, in turn, was smoothed out and blended to the best of the ability of the individual to give an even consistent surface. In color it varied from a very light pink to a very deep yellow. The photographic result was about the same regardless of

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color. Eyeshadow was a light blue, a green, or a black.

In creating characters there were very decided limitations in that colors of materials used were extremely limited and they were unsatisfactory as to consistency of color contained in manufacture. These discrepancies, coupled with the type of light used wherein cold arc light or a Cooper Hewitt Vapor light created a very ghostly effect both on and off the screen.

This was followed in turn by the early panchromatic film with which it was necessary to change the light to the incandescent lamp as explained in the article on lighting in this issue of INTERNATIONAL PHOTOGRAPHER (Page 43). This lighting change was also necessary with the advent of sound. It also became necessary to change the make-up bases from what had been a thick heavy substance to a monotone and the monotone was brown. The monotone developed and distributed by the Max Factor Corporation became the basis of our present day Panchromatic make-up material.

In comparison, present day make-up is as different from make-up of ten years ago as the difference between day and

night. Today the base is of a fine, flexible, thin material which can be applied evenly, quickly and thoroughly over the entire face giving perfect actuation to all muscles and features of the face. Decreasing the diameter of material used also reduces the amount of powder necessary to fix the make-up. Today there is a vast color range in bases used for make-up, a vast color range in materials used for high-light and shadow, a flexible color range in eye-shadow, a reduction in the color depth used for pencilling; and in all a complete departure from the old material and methods of application.

As to the changes brought about in the application of make-up, where ten years ago the application of make-up was not a fine art and the make-up artist was a very minor production factor, today the art of make-up has developed into what is indeed an exact art. This is well borne out in such recent releases as "Life of Emile Zola," "Lost Horizons," "Good Earth," "Marco Polo," "Prince and the Pauper," "Pasteur," "Parnell" and similar pictures. It is also noticeable that in the past few years the actor winning the Academy Award has invariably played a character to which a make-up artist, member of Local 706, has contributed greatly.

One could go into great detail and elaborate at great length on the various mediums used to create these characters,

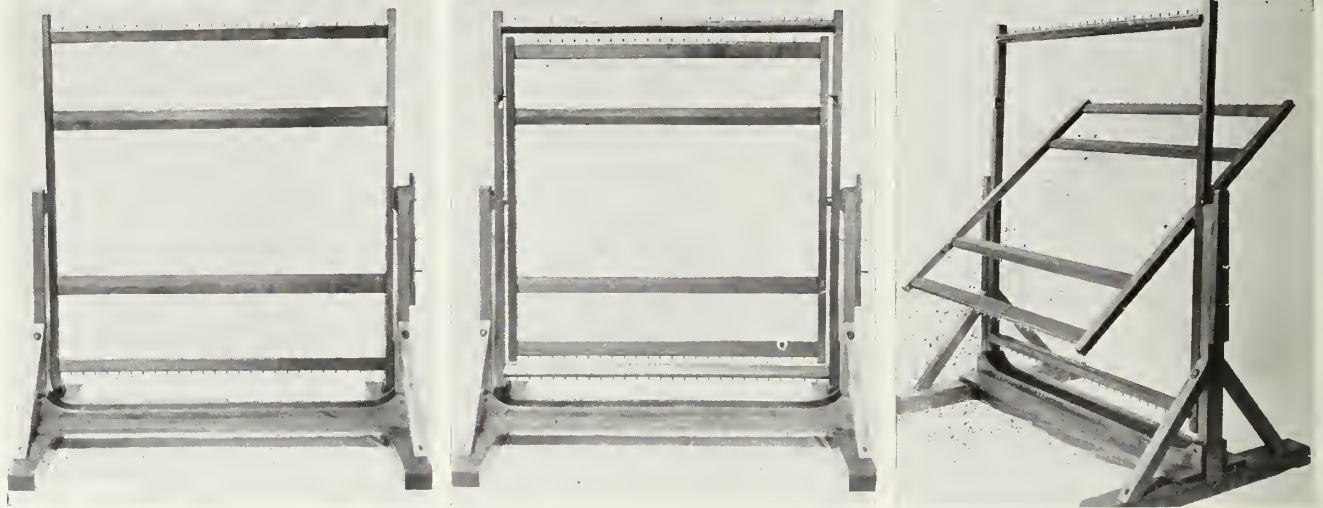
the substances, materials and appliances required to bring about these characters. By comparison it is indeed a far cry from "The Hunchback of Notre Dame" of Lon Chaney to the Sam Jaffe Lhama in "Lost Horizons," both very good, but very aptly illustrating the changes brought about and the reality of the characterization shown in the improvement of the art of make-up.

Screen make-up is better understood when it is remembered that the normal head is nine inches, while a big head close-up on a theatre screen is approximately thirty-nine feet or a magnification of the head to a dimension increase fifty-five times. It is obvious of course, that an eye-lash assumes the proportion of the thickness of one's wrist and by this same token any variation in the blending and applying of varying colors of make-up to the face or any lines applied to the face would photograph as lines, therefore, there can be no lines, but all effects must be carried out as shadows.

This anniversary issue resume, however, is intended purely as an introductory dissertation on the art of make-up, for a further, more thorough and complete history and technical elaboration, on the ways and means of make-up by myself and leading members of our local, now is being developed to appear regularly in coming issues of INTERNATIONAL PHOTOGRAPHER.

VERN MURDOCK, Local 706, IATSE

Laboratory



One of the last of the rack and tank setups was this outfit designed by Art Reeves in 1932 for

SCIENCE SUPERSEDES GUESSWORK

Addition of sound and color brought radical change in laboratory practice, centering around accurate measuring and control of the developing and printing processes.

The advent of sound into the motion picture industry is of course the significant event of the past ten years, and from it stem all of the major changes which have taken place during this period. Laboratory men have been called upon to solve many obstacles in order to reach the present high quality of sound reproduction.

In the pre-sound era, visual judging of picture quality was in most cases ade-

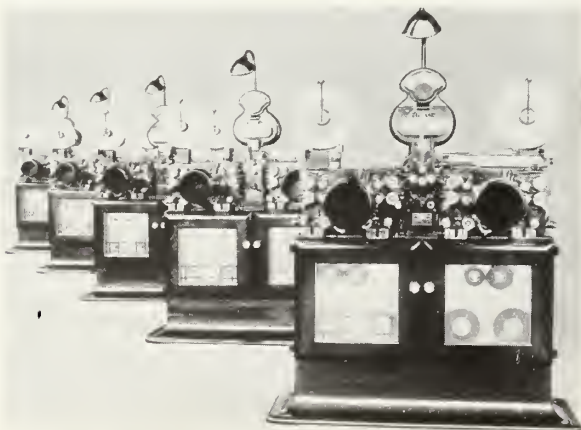
quate to maintain a reasonably uniform picture quality on the screen. Contrast and density could vary throughout wide tolerances before affecting picture quality to a troublesome extent. As a result, both the negative and positive processing were relatively simple.

Likewise, the rack-and-tank type of machine had served admirably for many years for development and fixation, even though its capacities were being somewhat taxed by the constantly increasing

volume of product required by the growing industry.

And then pictures suddenly found a voice. Laboratory processing was hard pressed. Technical men had to learn many new concepts, and had to learn them fast. No longer could the eye be trusted as a measure of contrast; instead the quantitative "gamma" with its merciless density-exposure requirements became the law. A multitude of sensitometers and densitometers blossomed where none had bloomed before. Within the next several years all film laboratories adopted the use of sensitometry as the major yard-stick in their control.

With the increasing use of accurate measuring methods and instruments, it



Modern efficient Bell & Howell battery of developing machines in use at MGM is shown at left, and right, John Nickolaus, head of MGM lab, looks over recording thermometer of air-conditioning system. Opposite page, right, are MGM's new toning and tinting machines, and left, Warner's new \$500,000 lab.



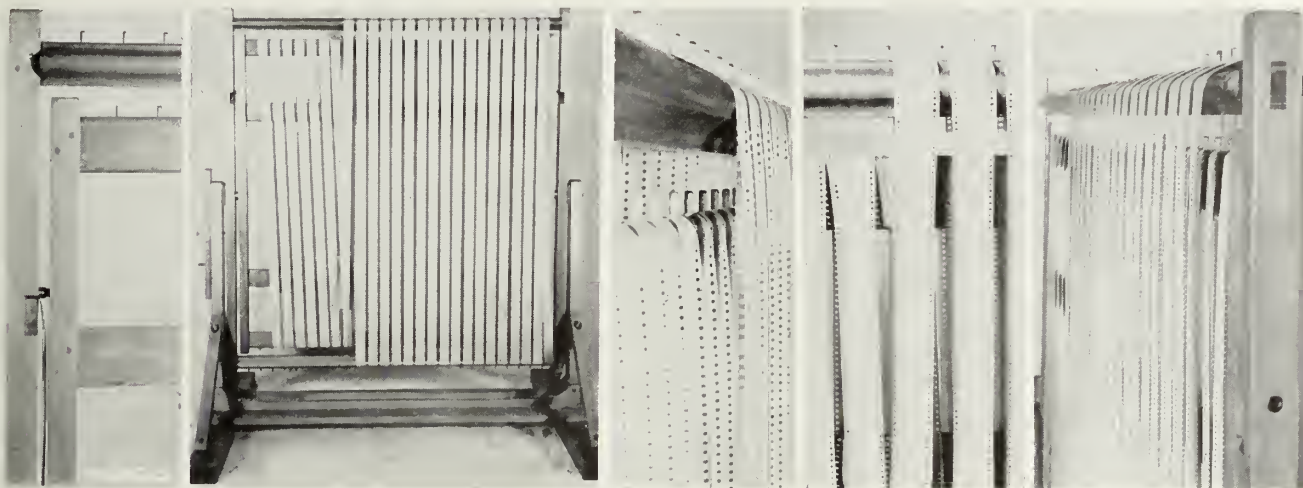
soon became apparent that the old rack-and-tank machines, already approaching obsolescence because of its limited capacity, was further doomed because of the inferior quality of processing. Continuous single- and multiple-strand machines were used in constantly increasing

ultra-conservative MGM has been rumored on the verge of a color program.

Other less spectacular color developments have been Cinecolor and Magnacolor to the point where they rival three-color processes, the virtual perfection of the Keller-Dorian lenticular system for 35 mm., the revival of the reseau process in

chemical engineering and research ability of the men in charge of operations.

A third change which has entered the industry in the decennial period just closed is that of continuous electrolytic silver recovery. Pioneered notably by Eastman Kodak Co., the continuous electrolytic recovery units are largely replac-



small laboratories. Rack and tank gave way to developing machines, when sound and color came in.

numbers, and for the past several years have been the sole processing equipment in use in Hollywood.

A second great change which has come into laboratory processing has been the perfection and widespread use of color photography, and especially the use of three-color photography. Although two-color photography has sporadically flourished for many years, notably during the two-color Technicolor and Multicolor periods of 1928 to 1933, it remained for Technicolor to perfect its triple-imbibition process and make three-color prints available to producers. First seen in cartoon form in 1932, and in action sequences in "La Cucuracha" in 1935, the beauty of this process infused new life into the color industry, to the extent that even

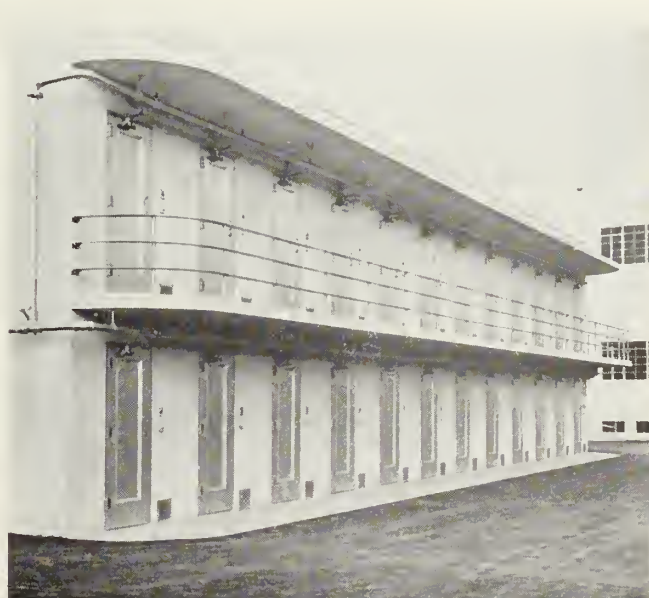
Dufaycolor, and the final commercialization of the direct-color process (described first by Fisher in 1913) under the leadership of Eastman with Kodachrome and Agfa-Ansco with Agfacolor, the latter still in the laboratory stage.

Large scale color processing is the ultimate test of the efficiency of the laboratory staff and equipment. The manifold operations and processes through which the images are produced require a nicety of control and precision far greater than black-and-white processing. Nevertheless, the laboratory staffs of the color companies have been equal to their problems, and the quality of color produced by the difficult Technicolor process and the even more difficult Kodachrome is indeed a tribute to the perseverance and

ing the older recovery methods, and are paying their way many times over. Most laboratories report that the silver recovered from the hypo (in the neighborhood of 1000 g. per million feet processed) more than pays for all chemicals used in development and fixation.

After this cursory glance at the developments in the film laboratory during the past ten years, let us venture a guess at the probable course of future developments.

First, we may expect the gradual realization of the value of rational chemical control in the laboratories, whereby chemical analysis of the processing solutions will make it possible for us to anticipate difficulty before it develops, and to rationally correct incipient trouble.



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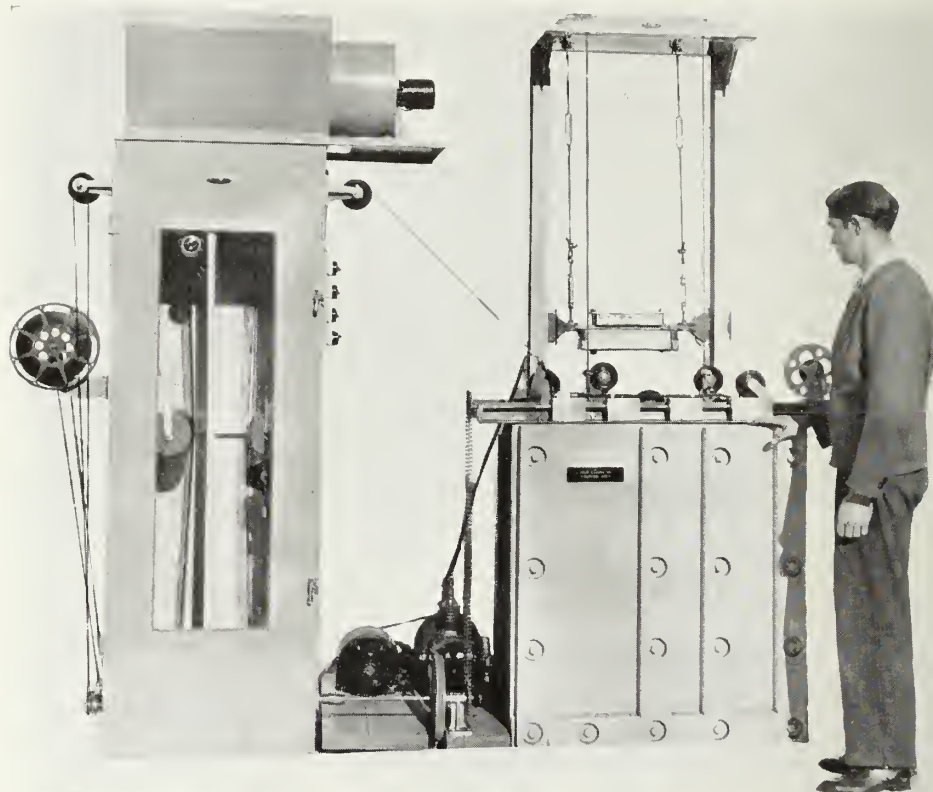
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Second, we will find increasing use of physical chemical methods of pH and redox in increasing the efficiency of all processing operations, both black-and-white, and color.

Third, we will find increasing use of recovery and regeneration processes,

whereby the financial efficiency as well as the chemical efficiency of solutions and operations will be greatly increased.

Last but not least, we will find a steady increase in the use of color, accompanied by a constantly improved color quality, and lowered costs. D. K. ALLISON



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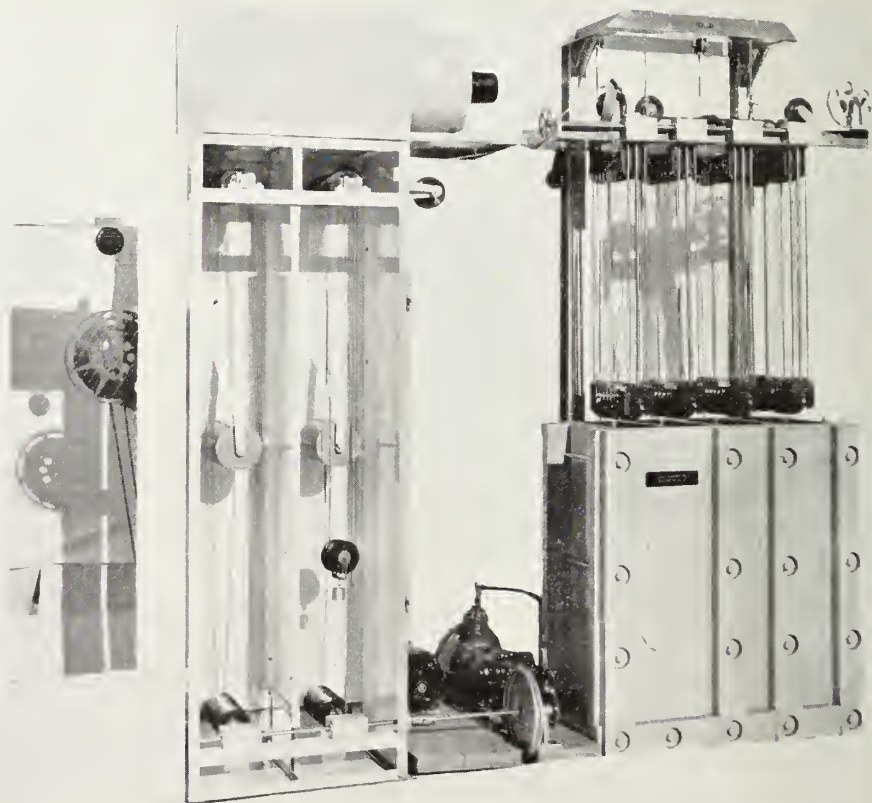
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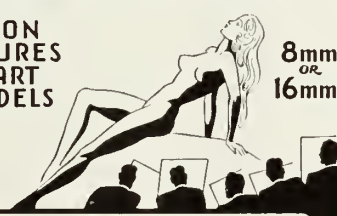
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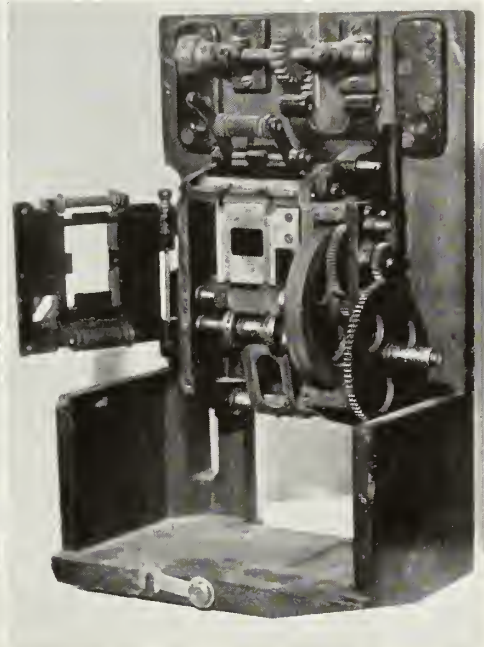
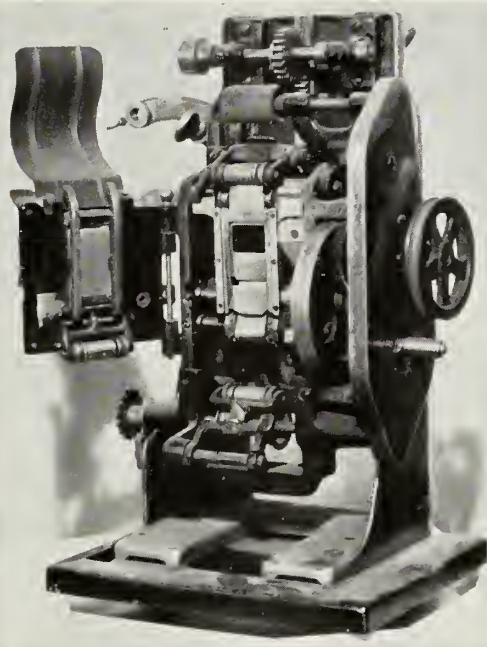
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WORK GUARANTEED

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Projection



The span of 30 years in projection progress is illustrated aptly with the modern streamlined Strong Copper Oxide Rectifier at left and the two views above of the old Edison Kinetoscope. The latter pictures are from the collection of Earl Hamilton, president of Local 150, IATSE, Los Angeles. The new rectifier, distributed in the Southern California area by John P. Filbert Co., is the latest improved type employing the new Westinghouse large copper oxide plates. Full details about the rectifier will be published in next month's International Photographer.

LIGHT SOURCES BIG IMPROVEMENT

Fundamentals of 20 years ago still basic in projection design; new era of refinements and coordination to improve sound quality on horizon.

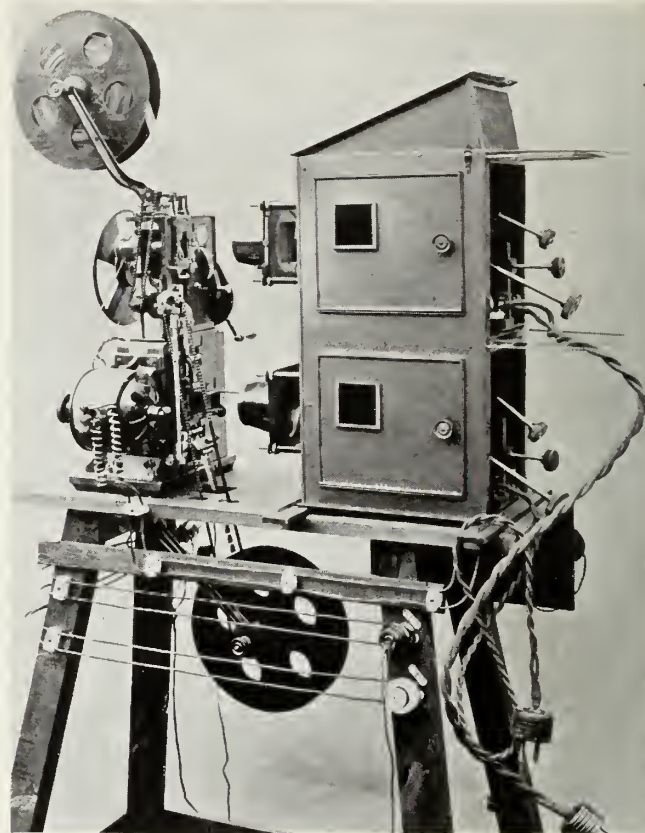
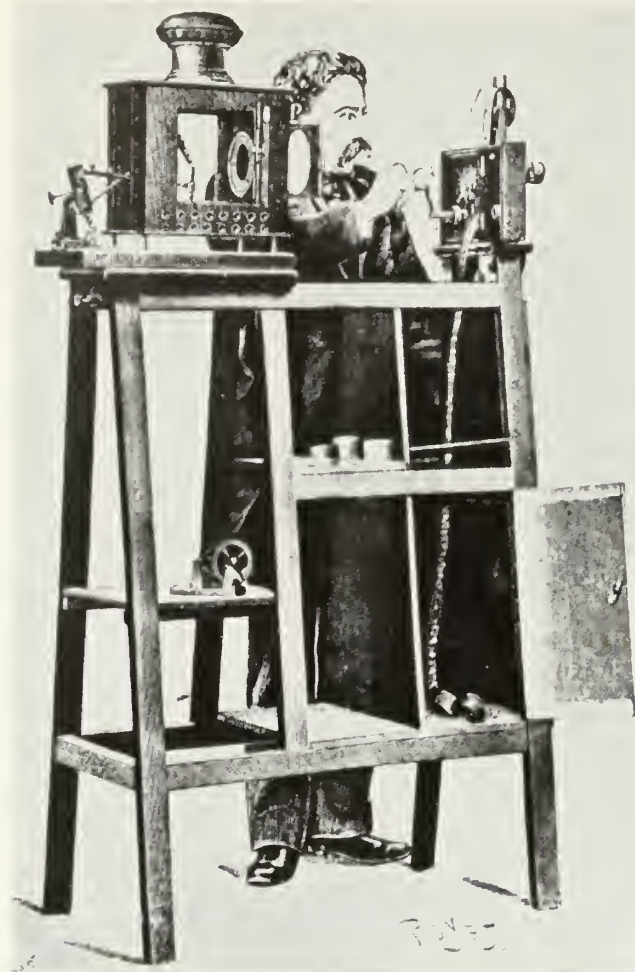
These anniversary numbers always bring back the days when, but it also brings to the fore the knowledge that the motion picture industry as it is today is still in the diaper stage. At the present time we like to refer to the days B. S. (Before Sound) which was just such a short time ago. I still have a little yellow card from the erstwhile ERPI telling me I was qualified to run Movietone and another one telling me I could run Vitaphone, when it was necessary to have an aperture that was adjustable to both films.

But going a little farther back—let's say another twenty years—just about the time your projection reporter was pro-

jectionist at the old Automatic Theatre on Main Street out here in Los Angeles, we were running the latest thing in projection equipment, as the pictures on this page show. The fine, modern Edison Kinetoscope! What did it matter if there was no back in the lamp house; that we had to squeeze the carbons together with a small hammer and pliers; that we had no ventilation in a booth just big enough to get into with not room for two people; and had to make patches with one hand and crank the projector with the other and feed the arc with what was left, as well as kick the basket that caught the film from under the machine so that

you could run a slide and thread up at the same time; and that once or twice a day, maybe oftener the man in the little room upstairs would scramble out between subjects to dash madly to the front of the house, while the audience wondered what was holding the show up.

All of this was thirty years ago, 1908. Now, suppose you take a real good look at the accompanying photos of old-time projectors and compare them with your new modern Motiographs and E-7 Simplexes. The original ideas are still used, we have not as yet been able to get away from the intermittent movement though we have improved and smoothed it and protected it against the old hazard of fire. But that is not all. We use the same type takeup on the lower magazine, although the similarity ends there. The rotary shutter is still used. More blades and a fan system are included to draw away



Left. Lumiere camera in use as a projector. This was one of the most practical of the early cameras, in that it was light in weight and was a camera, printer and projector combined. First used in 1895. (Courtesy Leo G. Young). Above. Lauste's "sound and scene" projection 1912. The lower lamp house was placed to illuminate the sound track. Film projection is old "Pathe Professional." The apparatus, was sold by Lauste in 1911, first to project sound pictures from same film. (Courtesy Merritt Crawford.)

all heat from the aperture. The star and cam action of the intermittent movement is practically the same as when we used to drop oil on it when in motion, and have the oil thrown over the film and onto the condensers in the lamp house, while now we fill the oil reservoir of the movement with oil and it is taken care of for days.

Remember the old type arc lamps, and rectifiers, transformers, then the motor generator sets? Compare them with the latest thing and, the new streamlined Copper Oxide Rectifier, using the latest Westinghouse copper oxide plate, illustrated on page 49. The wheel on the front is to increase or decrease the amperage. Had we had a thing like that in 1908 or even in 1918, the manager would have put it in the lobby in a glass cage. Nevertheless, the Mercury arc rectifier, as of 1910, with modern improvements, still is in use in many small houses in the rural communities, and the motor generator sets are just as popular as ever.

One particularly outstanding improvement in the finished product on the screen during the last decade is found in light sources. We have witnessed the evolution of the low intensity or mirror lamp from a laboratory experiment into a light source of sufficient intensity to deliver screen illumination in the range of eight to fifteen foot candles reflected light depending upon the size of the

image and the reflective properties of the screen. This singular advance was made possible, as lamp manufacturers are the first to admit, by the development of carbons of small enough size yet having sufficient carrying capacity to conduct sixty to ninety amperes without penciling. Well within these limitations are the National Carbon Co.'s product which has been named "Suprex." This product has done more to increase the screen illumination than any development that has thus far forged its way along the rocky road that leads to national recognition.

Further assistance was rendered by Bausch and Lomb, who perfected a reflecting mirror which is sufficiently immune to the terrific heat encountered within the lamp to be practical. The lamp manufacturers have made excellent use of these developments and have added ingenious feeding mechanisms which largely overcome the inherent weakness of all mirror lamps, that the field is affected by the slightest variation of crater placement. The success of the lamp is dependent upon the maintenance of the luminous ball at the tip of the positive carbon at the exact focal point at all times. Any variation of the position of the carbons while they are being consumed will immediately cause a brown,

uneven field on the screen. Late type lamps have almost completely mastered this shortcoming and they maintain a uniformly brilliant screen during screening with a minimum of manual adjustment by the projectionist.

Since this type of lamp has been on the market it has been adopted as standard equipment by several of the largest circuits of theatres in the country and bids fair to completely supplant all other types previously used. Its advantages are many. Chief of these is, of course, its clear white light. The fact that it uses little enough current to allow the use of copper oxide and other current rectification devices or of a very small generator. They have the added advantages of low cost in carbon consumption and a minimum of heat in the projection room.

Taken as a whole, the outstanding advancement in projection equipment since the "good old days" is the lamps I have just described in detail. This is to be considered as one man's opinion as of this date. As we delve into other phases of modern equipment for discussion in this publication in the months to come, I may even change my mind. Until then I believe the most important NEW thing in high class projection is the reflector lamp.

From the sound standpoint, while much progress has been made by comparison with the helter-skelter years when sound first was linked to the camera, there still remains much constructive work to be done. For the first time, technical experts are beginning to gain a degree of mastery over the major problems surrounding first class sound reproduction. New equipment allowing much wider latitudes and finer showmanship now is in use at the studios and a few theatres are equipped to take advantage of the modern trends.

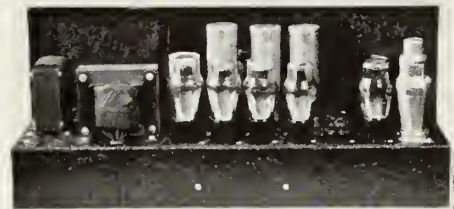
I do not believe that most of the craft will wish to be bored in this space with a mere recapitulation of the situation in terms of generalities and guesses into the future. It is the opinion of most of the technicians I have talked to since joining INTERNATIONAL PHOTOGRAPHER'S contributors, that this subject is one for thorough news coverage month by month.. It is our plan to do just that in this Projection Section of INTERNATIONAL PHOTOGRAPHER.

At the present time, we are entering an era of refinements and improvements in sound reproduction in the theatre, which if not hampered by a severe business recession, will produce enough news each month to fill several issues of INTERNATIONAL PHOTOGRAPHER such as

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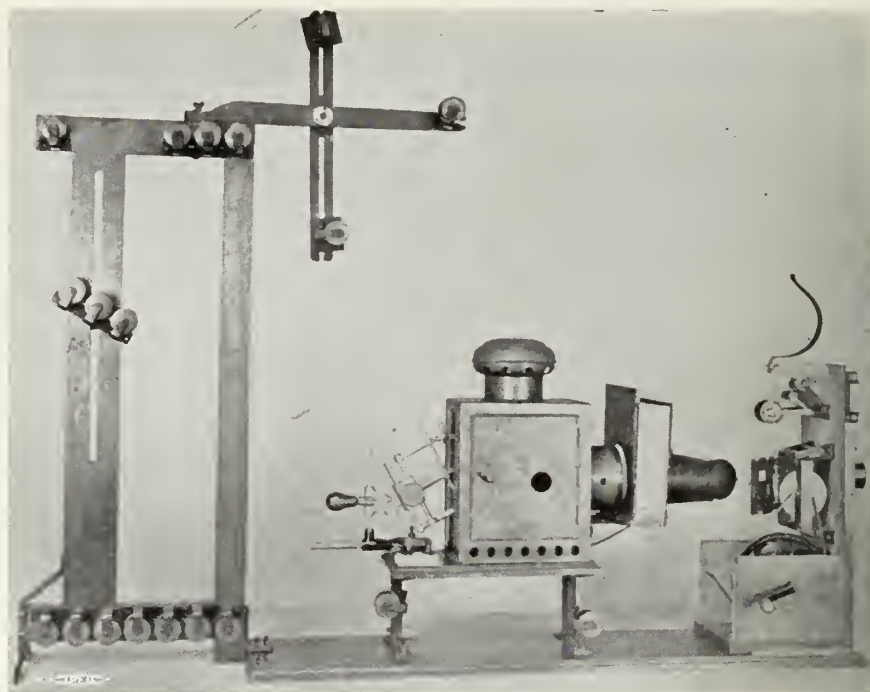
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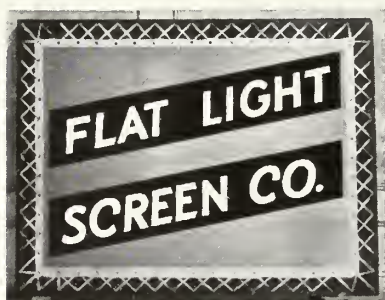


Compare this continuous loop Edison Projecting Kinetoscope first made about July, 1896, with the modern MGM studio continuous setup on next page. This type of projector sold outright for \$75 and could project a picture for 50 feet. Note the spool-bank which held 15 to 40 feet of film running continuously. It was made under the Edison and Armat projection patents and followed the introduction of the sister projector, the Edison Vitascope, which was made exclusively for renting on a states right basis through Raff & Gammon.

this. The situation presents opportunities to everyone from the producers to the apprentices in projection for cooperation toward getting a better picture on the screen. It will be our sincere attempt

to cull this news over and skim off the cream, and to present it as succinctly as possible and with a maximum of interesting and informative illustrations.

PAUL R. CRAMER, Local 150, IATSE.



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WHAT'S NEW

Portable Booth

While last month talking to Merrill Chamberlain, chief of projection at MGM, about what was to be had in the way of something new in projection

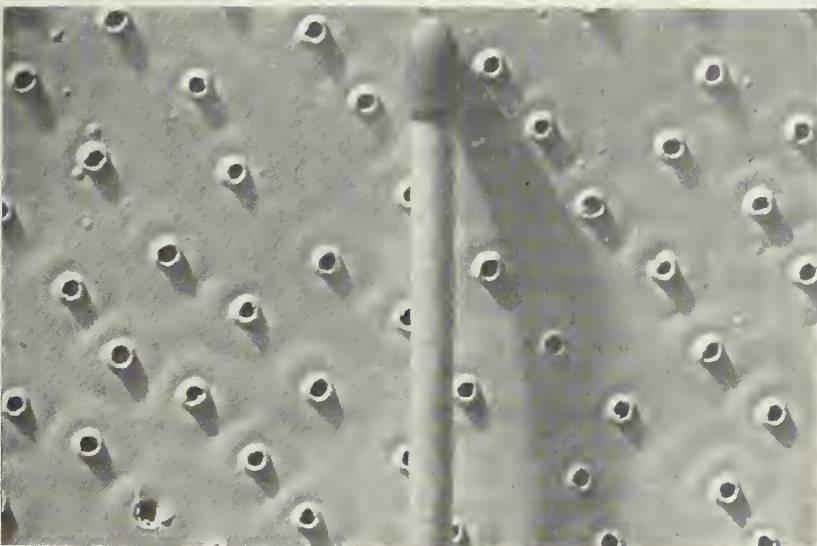
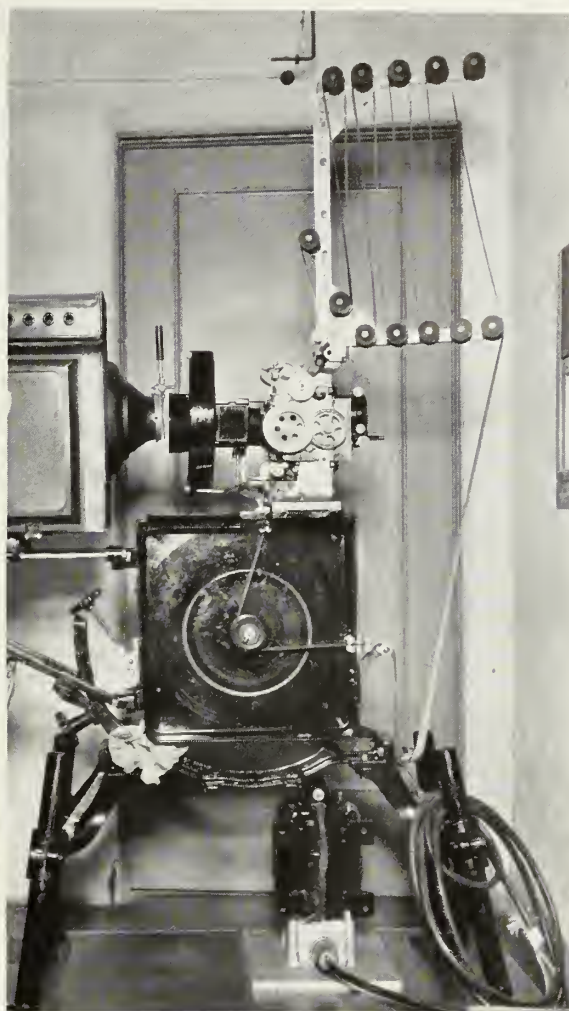
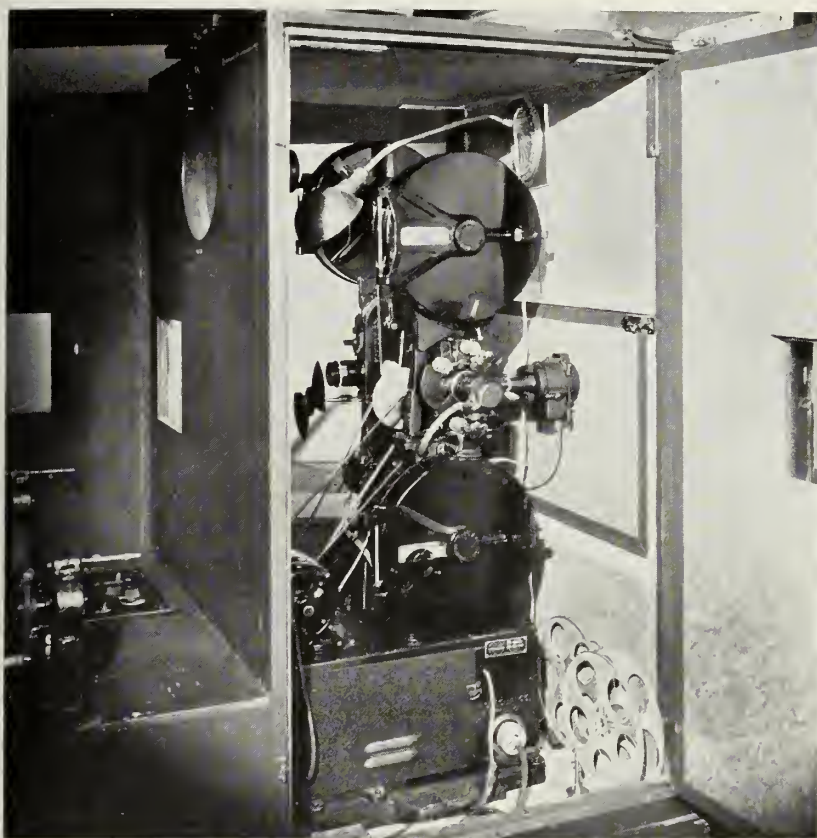
equipment, I saw two prop men rolling a square box onto one of the stages, and seeing a rewind attached to the front, naturally my curiosity was aroused. I followed along behind to see where it went and what was to be done with it when it arrived at the end of its short journey.

To make a long story short as possible this box with myself in tow ended up on one of the large stages in the presence of Director W. S. Van Dyke. No sooner had the two prop men stopped than several other men took charge. There was plenty of action from then on. Some of the men started to connect various cables to outside terminals; another started to erect a 4 1/2 x 6 foot portable screen, another cleared a space for the audience on the set to see the picture as well as hear what was going on.

About this time a very important individual walked up and inquired as to

DON'T MISS the start in the May issue of the Projectionist's Book of Tables by William Comyns

internationally known authority on electrical training, and the director of official school of Local 150, IATSE, and cooperating Southern California projectionist locals.



Top left illustration shows MGM's portable projection booth, described in the accompanying article by Paul Cramer; and at top right, the same studio's novel new loop rack machine for synchronization of effects and dialogue; which is explained on this page. Crater-like surface at left is a close-up on the new Flat Light screen, described on Page 60. The picture was made by an amateur photographer among the projectionists, C. C. Troxel, of Local 37, IATSE, operator at MGM studios. It was shot with his wife's Contessa-Nettel camera, on Eastman Panatomic at f:11, one-fifth second, with one Photoflood directly over the screen. The print is on Eastman Bromide.

where the film was. This was forthcoming at once from the cutting room. Then I found out what this thing was all about and who the important looking gentleman was. He was the projectionist and the square box that I had followed was a portable Moviola-projection booth. Film to be shown was a scene taken the previous day, around which there was considerable discussion, so this equipment was called into action to project a picture as well as run a separate sound track on either 16 or 35 mm. film.

In the accompanying picture layout you will see this equipment. Note that the sound head on side facing camera threads just the opposite to the projection head on the far side, can be run backward as well as forward at any

speed, just in case there is a necessity for a check on synchronizing. The projection head is equipped with a $3\frac{1}{2}$ " lens which throws a $4\frac{1}{2} \times 6$ foot picture on a screen 8 feet away. In this case the horns are set beside the screen and a Mazda lamp is used for illumination. Interlock between projection head and sound head in this case is necessarily mechanical. You will also notice that there is no room for the projectionist in this little room, which is absolutely sound proof when running. This is one of Brother Chamberlain's designs, created by experience for the needs of the moment during production.

After the scene had been run forward and backward for a while it was finally approved and Brother Chamberlain

asked me if I would like to see the new loop rack machine over on the synchronizing stage, so over we went to the next block and to a much smaller stage where there were mixers, recorders, projection machines and mikes all over the place, but the machine I wanted to see was off by itself, and quite individual, as the accompanying illustration shows.

Versatile Loop Racks

This device is used for synchronization of either effects or dialogue. The loop is used so that any number of takes can be made without rewinding or rethreading. The loops vary in length, but this machine can handle up to an 80 foot loop and is electrically interlocked to

the recording machines so any sound effect or dialogue recorded in synchronization with the loop can be re-projected with the same loop. The best takes are selected, then loops and selected sound takes are re-cut into the working print of the picture. You have no doubt wondered time and time again how the dialogue was taken in mob scenes, fights, windstorms, and various other places where it is impossible to hear one talk let alone make a recording of it. Well, this machine is the answer.

The machine, itself, is not so complicated, but the uses it can be put to are too numerous to try to tell you about in this issue. The complete equipment consists of (from top to bottom) a rack to hold the rollers that guide the film, rack being interchangeable, according to the size of the loop, thence through the standard rear shutter type Powers projection head and into what was once upon a time a lower film magazine; over this roller then back out and up to the loop rack again. Note just below this magazine on the bottom, the position of the synchronous motor. This motor is set perpendicularly and drives straight up, with only one gear to connect it to the projection head.

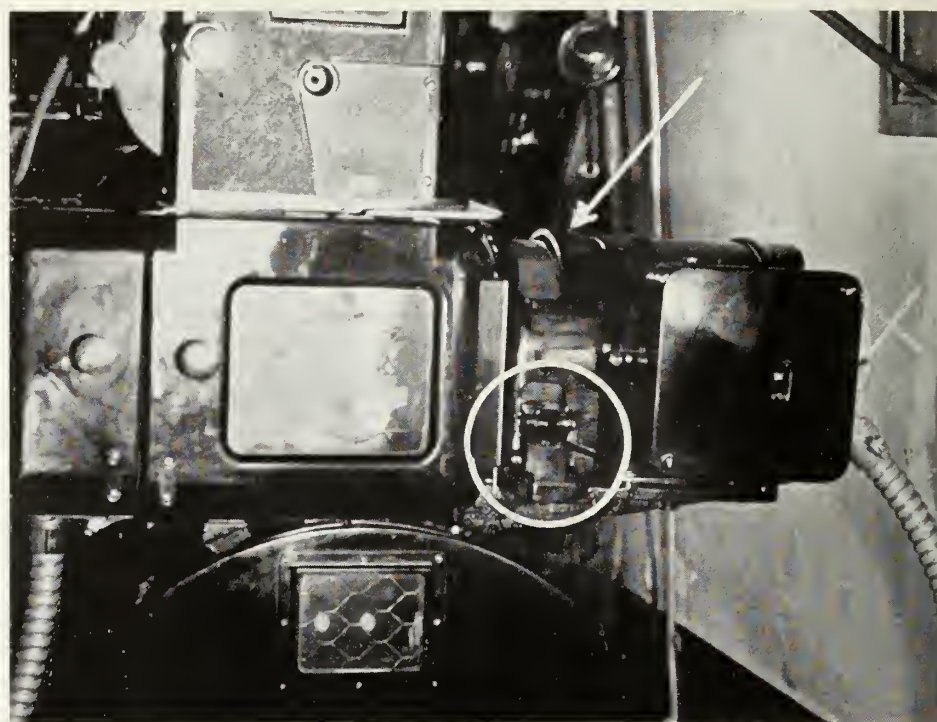
From this stage Brother Chamberlain took me to another projection room where he was making some tests with a new projection screen. There I met Engle of the Flat Light Screen Company who was assisting in making this test in comparison with other projection screens now in use.

They pick various screens at random and put them side by side, showing half a picture on one screen and half on the other. We were very pleased to note that there was approximately 30 to 35 per cent more brilliant on the Flat Light screen than on the other one. Using a Weston Photometer we were able to measure one foot candle more and a fraction under one foot lambert more of brilliance on the Flat Light screen, than on the comparison screen.

While talking to Mr. Engle after the test and listening to his enthusiastic sales talk, I find I must disagree slightly with some of his assertions, but as a whole the screen proved highly satisfactory from all tests, as far as projection is concerned.

To explain to you some of the radical departures of this screen and why, in my estimation, it proved more superior:

First, the screen is seamless; it is made of two gelatinous masses. First or base is a yellowish hue, about the color of orange Jello; second coating is of a sort of creamy consistency when applied but later on turns snow white. Due to its non-porous nature it absorbs practically no dirt and can be washed with Ivory



This close-up on the new RCA motor, described in detail on this page, was made by Bramel of Local 150, IATSE, with his Model M Leica with f:2 Summar lens, taken at f:4.5, one-half second, using one Photoflood at right of camera. Print was made on an enlarger of his own design on Defender Velour Soft Black.

soap and lukewarm water, without harm to it.

Second, we find that there is very little distortion at a viewing angle of 40 degrees on either side. This is due, as you will note from the accompanying picture, to the innumerable little cones protruding from the screen, which have an unusual power of reflection, thereby practically eliminating distortion from the sides. This screen should be exceptionally fine for houses with a short throw and a wide auditorium. In his letter which I have before me, Mr. Engle claims that this screen will eliminate keystone, but we have found that it will eliminate only a certain amount of the keystone illusion, but that it does have a tendency to improve the quality of the picture, especially color pictures, and also seems to have a slight stereoptic effect.

The lamp used with this text was a Peerless Magnarc lamp, using Suprex carbons, drawing approximately 90 volts and 68 amperes, with a throw of about 90 feet on a 14x17 screen. This screen has not been fully tested and approved for sound as yet. Complete report for sound will be in the May issue of INTERNATIONAL PHOTOGRAPHER.

New RCA Motor

Coming back from MGM that day, I dropped in to see Brothers Bramel and Moelle, members of Local 150, IATSE, to see a new installation they had called about and found that RCA was putting

out a new motor, as the accompanying photograph shows. Advantages are quite numerous but space this month permits me to review only the most salient improvements.

The new flywheel, now located between motor and projector head (as the arrow indicates) gives a much smoother and slower start, doing away with the fluctuations due to varying line voltage. The small knurled wheel that was on the shaft between the motor and projector head now has been moved to the head end of the motor (as the cross indicates) which makes it very handy to reach to turn motor over by hand. Also, owing to the fact that this flywheel will naturally make the machine coast farther when power is shut off (15 feet) RCA has installed a very fine hand brake (located in the circle).

Under the projector head is a new sump or oil pan that is quite an improvement over the old one in that it really catches the oil, leaving the sound head clean and dry, and is so arranged that the oil runs off into a receptacle built into and a part of the motor housing. This receptacle has a heavy brass petcock to drain it when full, and last but not least the motor bearing nearest the projector head is greased only every three months and with a grease gun.

There are several installations at the present time in Hollywood and in every case the projectionist is very well satisfied with the performance of this new motor.

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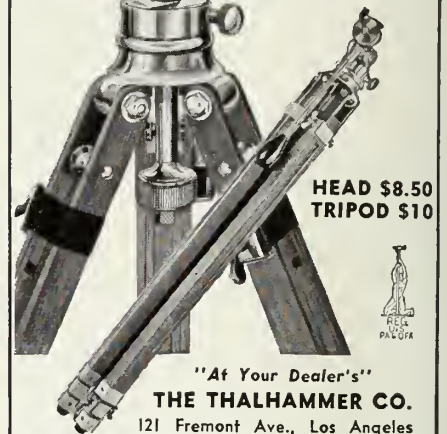
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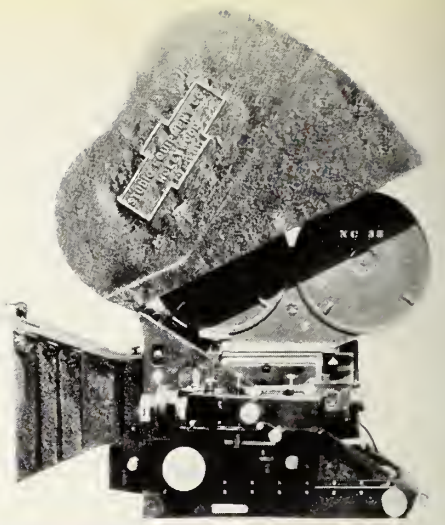
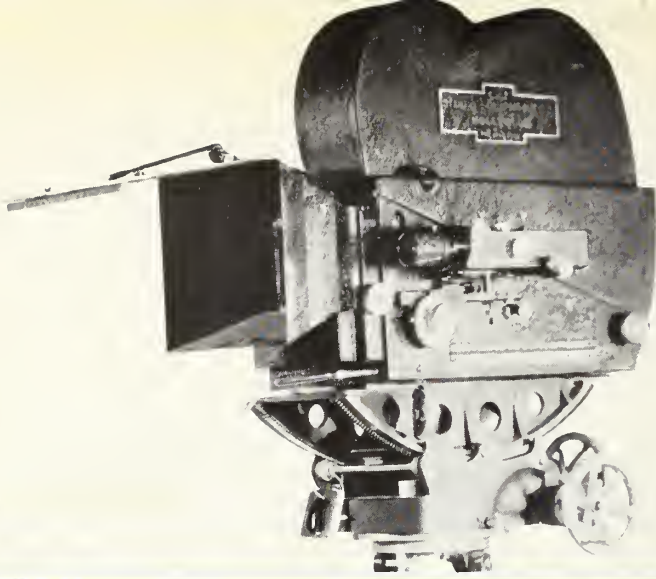
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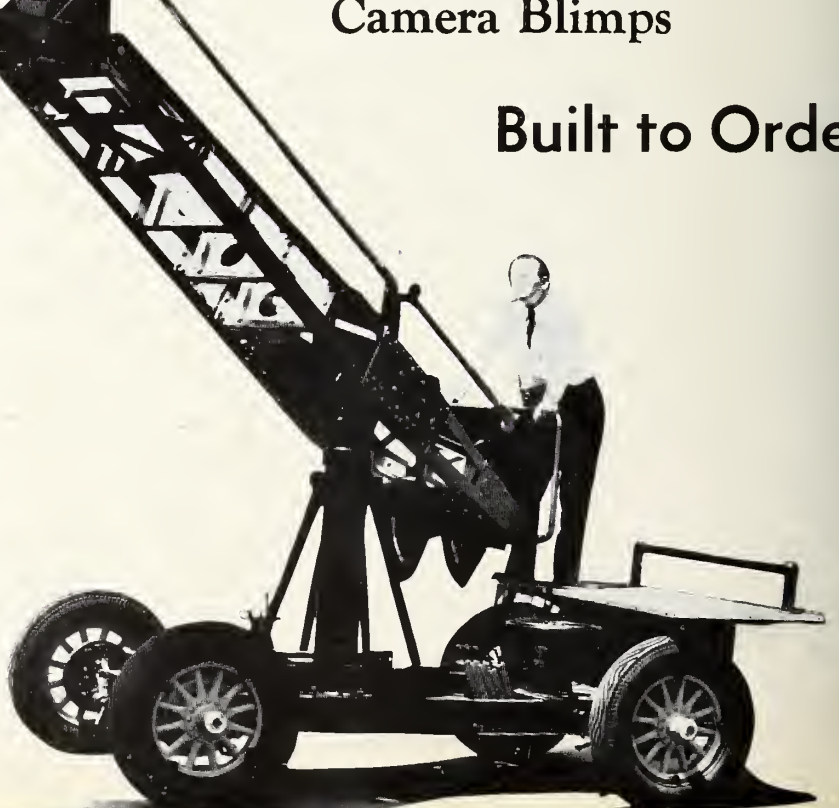
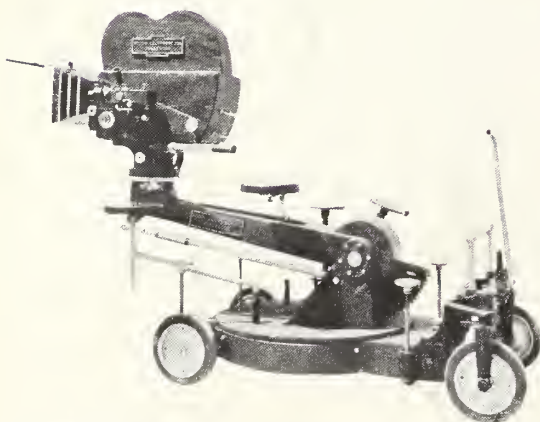
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PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

Hollywood, California

No. 4



Balanced
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The ideal balance of color sensitivity for the purpose intended is a mark of Du Pont cine film products.

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We make all sizes and types of rear projection and television screens, the standard of quality in major studios. Tough and flexible, our screens roll easily for shipment and can be set up within an hour. Our Flat Light screens are polarized by a complicated process to eliminate "hot spot."

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The latest and most highly developed equipment available for doing all types of composite photography, both motion picture and still, in either black-and-white or color.

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Our plant in Hollywood features a projection process stage, with latest type lighting equipment, dressing rooms, film vault, dark room, projection room and shop. These facilities are supplemented by a complete film library and still background library.

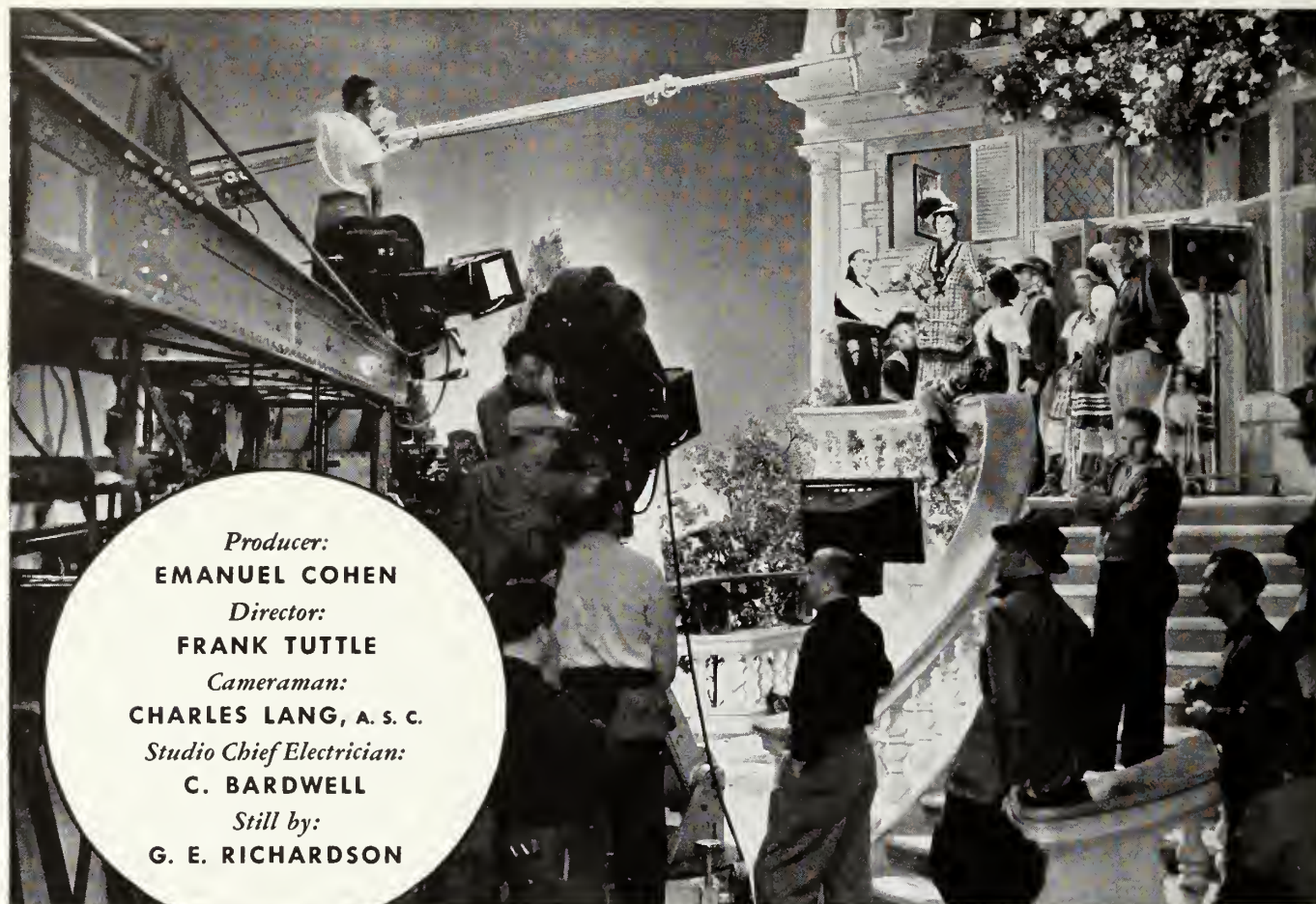
Our new plant at 1117 North McCadden Place, in Hollywood, now is nearing completion and will be in full operation on or before May 15.

Estimates gladly furnished on all types of miniature and scale models and trick photography in general.



STUDIO

1117 North McCadden Place, Hollywood, Calif.
E. Roy Davidson, Technician
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Director:
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Cameraman:
CHARLES LANG, A. S. C.

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A "still" interlude during the shooting of PARAMOUNT'S new Bing Crosby musical, "DR. RHYTHM," reminds us to remind you that—

G-E MAZDA lamps are VERSATILE

You can use G-E MAZDA lamps to light the whole set, as in this scene from "Dr. Rhythm."

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And there are some 9,000 different types and sizes of G-E MAZDA lamps, upon which you can call to produce any lighting effects you desire.

Are you benefitting fully from this versatility and flexibility? General Electric Company, Nela Park, Cleveland, Ohio.



Moviefood

GENERAL  ELECTRIC
MAZDA LAMPS

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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J. N. A. HAWKINS, PAUL R. CRAMER, WILLIAM COMYNS.

Vol. X.

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No. 4

ON THE COVER. First dip of spring captured by the camera of Hal A. McAlpin, member of Local 659, IATSE, of the Paramount still department. The player is Alurie Lane, young Paramount stock player from New Orleans. The background, the Pacific, near Laguna Beach.

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International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

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Telephone: Hillside 7221

Publication Date: 5th of Each Month



FILM PACK CAMERAS GO CANDID

You'll give your Speed Graphic, 9x12 cm. or 2¼"x3¾" film pack camera the convenience of an expensive minnie when you install a Kalart Synchronized Range Finder. It gives your camera automatic focus plus all the advantages of man size negatives. Always accurate and dependable, the Kalart Synchronized Range Finder makes the "guess focus" shots things of the past.

Model K, \$20.50 installed, now available for 36 different 2¼"x3¾" and 9x12 camera and lens combinations. Model G, \$27.50 installed, for ¼"x3¾", 3¼"x4¼", and 4x5 Speed Graphics. Special installation for 5x7 Speed Graphics and 9x12 Linhof cameras, \$32.50.

NEW KALART MICROMATIC SPEED FLASH

Fits practically all cameras . . . \$13.50

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We are pleased to announce that our

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**KINO-HYPAR F2.7 15 mm
WIDE-ANGLE LENS**

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**KINO-HYPAR F2.7 75 mm (3")
for LONG-DISTANCE SHOTS
and CLOSE-UPS**

can now be had as Standard Equipment with the BOLEX 16 mm MOVIE CAMERA. Other focal lengths can also be supplied.

The distributors of the precision-built BOLEX camera made this choice after a thorough test of the American-made GOERZ LENSES to assure their customers of the best possible picture results.

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317 EAST 34TH STREET NEW YORK CITY





Already more than 5000 theaters have installed high intensity projection. With high intensity projection in one theater out of every three, audiences are rapidly becoming aware of the difference. They are seeking out the theaters that provide better picture quality on the screen, more comfortable seeing and more pleasant general illumination. With old style low intensity projection there is seldom enough light on the screen for good, comfortable seeing even in the best seats. At the back of the house screen brightness is so much reduced that pictures are dim and unsatisfactory.

Modern fast action and the new color pictures call for Simplified High Intensity projection. "Simplified" means new type lamps and "Suprex" Carbons. These have so reduced the cost per light unit on the screen that any theater can now afford high intensity projection.

The illustrated booklet, "The Eternal Triangle in Picture Projection," will tell you about it. Write for a copy.

SIMPLIFIED
High Intensity
PROJECTION
 WITH "NATIONAL SUPREX" CARBONS

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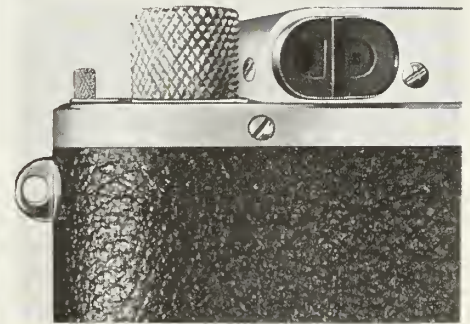
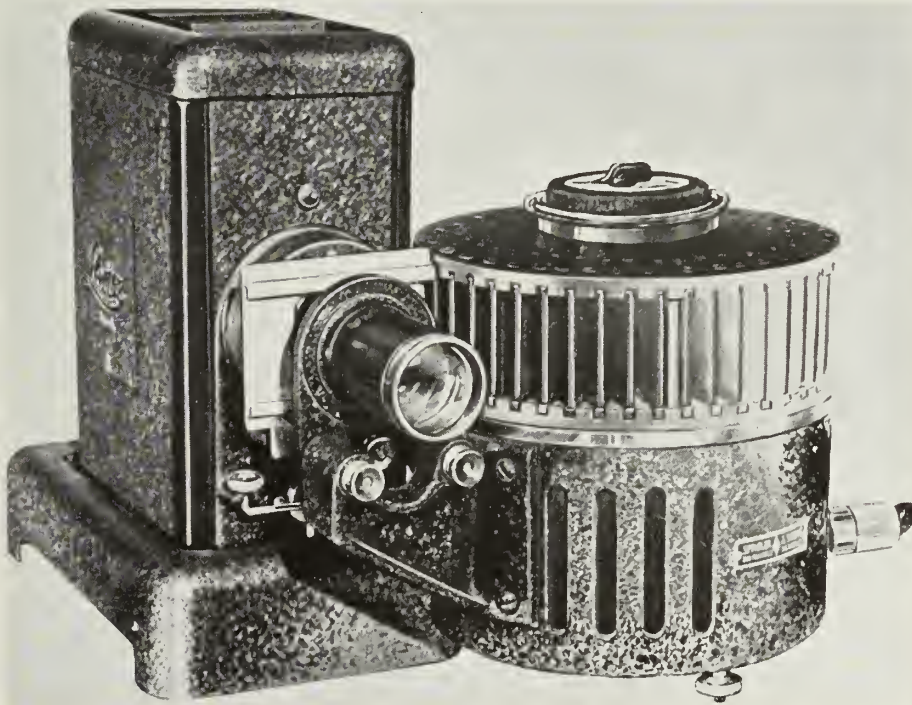
CAPACITY PERFORMANCES BENEFIT THE STUDIO AS WELL AS THE THEATER

The studio, as well as the local theater, gains profit and prestige from increased attendance. An important factor in building theater patronage is better projection. Here is a reproduction of the current trade journal advertisement in the campaign for improved motion picture presentation.—NATIONAL CARBON CO., INC.

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

Tradewinds



Above, a close-up on the closely placed viewfinder and rangefinder of the new Leica 1938 Model G. Left, the Selectroslide for use with the Leitz Model VIII-S projector.

News of New Products

Leica Model G

Improvements in the new 1938 Leica, Model G, feature a newly designed viewfinder and rangefinder system, through which the eye-pieces of these units are placed closely together to enable the photographer to change from one to the other almost instantly. This speeds up camera operation considerably. The Leica method retains a separate magnified rangefinder image, making focusing rapid, simple and accurate. Prices on the Model G range from \$183 with f:3.5 lens, to \$315 with f:1.5.

Manufacturer: E. Leitz, Wetzlar, Germany; **Distributor:** E. Leitz, Inc., 730 Fifth Avenue, N. Y.

Selectroslide

A convenient and ingenious device for slide projection is the Selectroslide, designed for use with the Leitz Model VIII-S projector. A rotating turret holds 48 2x2 inch slides and will make slide changes automatically or by push-button control. The device is particularly valuable for one-man stereopticon demonstrations and lectures, and obviates any errors in projection sequence of slides.

Manufacturer: Spindler & Sauppe, Inc., 86 Third St., San Francisco, Calif.

Two Wabash Bulbs

Newest flash-bulb from Wabash is 30 per cent smaller than the smallest flash-

bulb made to date, approximately as tall as a package of chewing gum, and called Superflash No. 0. Total light output exceeds 22,500 lumen seconds, intended for open and shut shots with average films and synchronized speed shots with the new fast films. Also announced is a new Special Press 40,000 bulb, slightly larger than the standard Superflash No. 1. This has a total light output of 40,000 lumen seconds, and is designed especially for press photography, particularly with candid cameras and others with focal plane shutters.

Manufacturer: Wabash Photolamp Corp., 335 Carroll St., Brooklyn, N. Y.; **Distributor:** Sold direct, dealers.

New Enlarger Projector

The new Enlarger Projector from Hollywood Photo Supply Company offers a number of attractive features as an enlarger and also is a practical projector for showing positive prints, slides, color slides and transparencies. Features include: heat absorbing filter, revolving head, extension arm, new type negative holder, new type projection lamp, extra large baseboard, double plug receptacle, 15-foot cord, double condenser system, iris diaphragm, spiral focusing mount, and a 2-inch anastigmat f:4.5 lens. An adapter is available to use miniature camera lenses. The Enlarger-Projector with interchangeable lens mount, complete lens, costs \$25,



with lenses and accessories proportionately priced.

Manufacturer: Hollywood Photo Supply Co., 5855 Hollywood Blvd., Hollywood, Calif.; **Distributor:** Direct, dealers.

New Ampro Model U

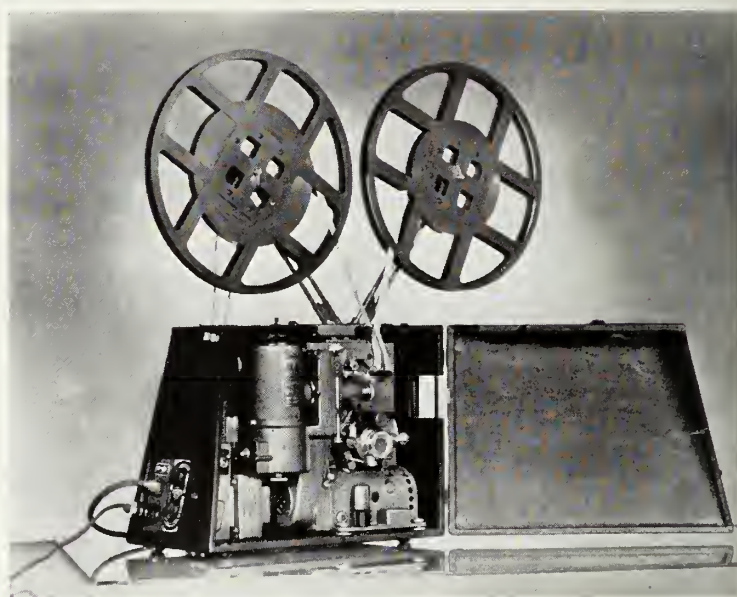
Ampro has added a new powerful, A.C. operated sound-film projector, with 750 watt lamp to its 16 mm. line. Designated as the Model U, it features an amplifier output of 15 watts undistorted, with 30 watts maximum, together with 12-inch permanent magnet field speaker. It is intended for classrooms, auditoriums, industrial sales and home entertainment where maximum illumination and reproduction are required. Innovations in the Model U include a speaker hiss eliminator, allowing full volume without hiss at low voltage; and an amplifier signal light which indicates when amplifier is on and also designates location of volume and tone controls when rooms are darkened. New model is extremely compact and portable. It sells for \$395, with a sound-proof blimp case \$20 extra.

Manufacturer: The Ampro Corporation, 2839 North Western Avenue, Chicago, Illinois; **Distributor:** Direct, dealers.

Victor's Model 33

Victor has entered the low price 16 mm. sound projector field with a precision made new "all-in-one" Model 33 Animatophone, priced at \$295 complete. New model handles sound sufficiently for audiences up to approximately 250-300 people. As priced the new model comes with 500 watt lamp, 2-inch f:1.85 projection lens, and hand rewind. A deluxe model with motor rewind, 750 watt lamp and f:1.6 lens will be on the market soon. A standard feature is an input jack for plugging in a high impedance mike for announcements, or a phonograph turn-table for recordings.

The Model 33 assembles into one compact unit for transporting. For operation, the main unit subdivides into three integral parts. A removable top houses 1600-foot reel arms, a 400-foot take-up



Above, three view of the compact new Victor Animatograph Model 33 sound projector. Below, two shots of the new Hollywood Enlarger Projector.



reel, and the projectors attachment cord.

The special 8-inch speaker with 50-foot connection cable is housed in its own baffled case, which may be instantly detached from the rear of the projector case. After removal of top and speaker, the projector is entirely enclosed in its own case with a convenient control panel located at the rear.

Model 33 Animatophone incorporates a number of the Victor features, including automatic film protection device, the multiple-wall lamp house with super-efficient ventilation, swing-out lens mount, and keyed-in-position sound system.

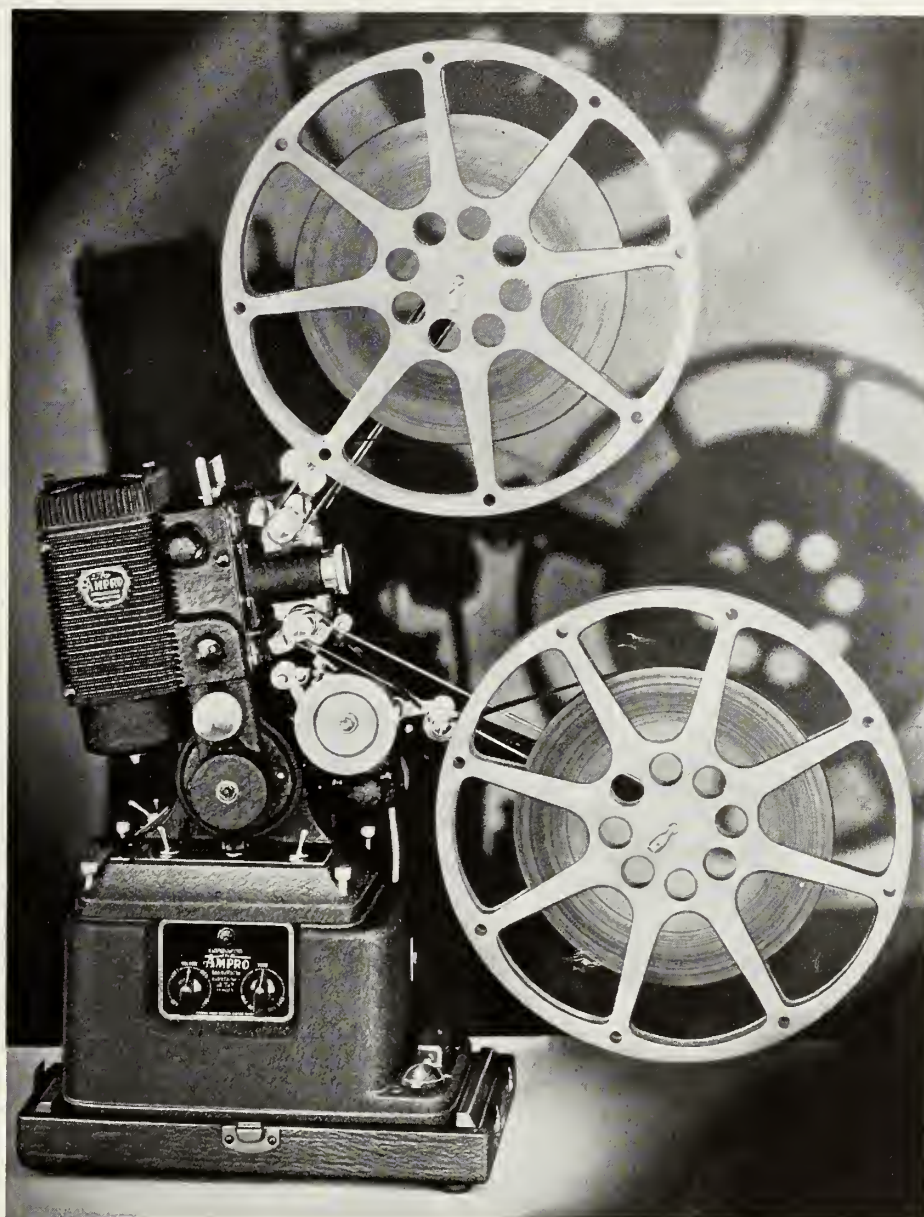
Manufacturer: Victor Animatograph Corp., Davenport, Iowa; **Distributor:** Direct, dealers.


Fast Eastman Cut Film

A new Super Panchro-Press Film, more rapid than Panchro-Press, but retaining all the physical characteristics of this popular emulsion, is now available from Eastman. Extremely fine grain, freedom from abrasion, excellent gradation, and a reasonable development time which permits control under unfavorable temperature conditions, are claimed for the new Super film.

Super Panchro-Press will produce a softer negative with normal development than other ultra-speed press films. This is a distinct advantage in flash work, when contrasty lighting is the

Right, the new Ampro Model U sound projector, and below, a reproduction of the new pocket rule card available from Smith & Aller, with handy notations on the company's DuPont Superior Pan Type 100.





PARPAN TYPE 116
Superior Panchromatic Type 100

FILTER	INCREASE		STOPS
	Filter Factor	Stop Factor	
Aero 1	1.5	3/4	15
Aero 2	2.0	1	20
21	3.0	1 1/2	23
23A	4.5	2 1/4	28
25A	6.0	2 1/2	32
29F	12.0	3 1/2	40
12	2.0	1	45
15C	2.5	1 1/4	56
3NS	3.5	2	63
SNS	5.5	2 1/2	80
25N	2.0	1	90
50N	3.0	1 1/2	110
75N	5.5	2 1/2	125
			160
			180
			220
			28
			32

SMITH & ALLER, LTD.
6656 Santa Monica Blvd.
Hollywood, California

rule. When added contrast is desirable, added development of 30 to 40 per cent will give negatives with ample snap and brilliance.

The new Super film retains another valuable trait of Panchro-Press, continued development will build up excellent shadow detail in underexposed negatives. Despite its added speed, grain is for practical purposes as fine as that of Panchro-Press.

Tests with the new emulsion indicate that it will give excellent results when developed under normal press conditions. Where more rapid processing is desirable, D-19 developer is recommended. The fixation rate is identical with that of Panchro-Press. It is made less sensitive to red than other ultra-speed press films, and gives well-balanced color rendering.

Manufacturer: Eastman Kodak Company, Rochester, N. Y.; **Distributor:** Direct, dealers.

More Superpan Sizes

Agfa's fast Superpan Press cut film now is being supplied in several new sizes, including 6.5x9 centimeters,

2 1/4 x 3 1/4 inches, 2 1/2 x 3 1/2 inches, 11x14 inches and 12x20 inches. The standard sizes of 9x12 centimeters, 3 1/4 x 4 1/4, 4x5, 5x7 and 8x10 inches, of course, continue to be available.

Manufacturer: Agfa Ansco Corporation, Binghamton, N. Y.; **Distributor:** Direct, dealers.

New Location Service

Hollywood Screen Service, headed by James R. Palmer, member of Local 659, IATSE, now offers shooting service complete with sound and full camera and lighting equipment for location, projection background, expedition and industrial film making. Arrangements are either by contract or salaries and rentals. Black-and-white and color are available, either on 16 mm. or 35. The organization also offers a special dehumidifying process that insures preservation of film in tropical areas.

Goerz Catalog Out

A new catalog covering Anastigmat lenses for professional and amateur photography, photo-engraving and movie-making, also accessories used by

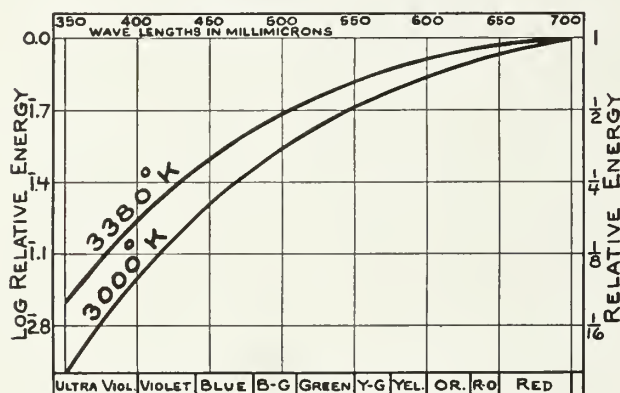
The CINEMATOGRAPHER'S BOOK of TABLES

By Fred Westerberg

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SPECTRAL ENERGY DISTRIBUTION

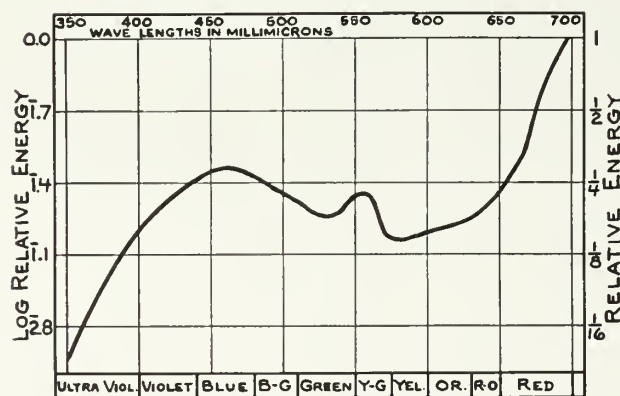
MAZDA LAMPS



3380°K is the color temperature of lamps rated at 33.5 lumens per watt. This includes the 5,000 and 10,000 watt lamps as well as the full line of C. P. lamps.

3,000°K is the color temperature of a typical long life M. P. lamp, 1,000 watts, PS-52 bulb, 20.7 lumens per watt.

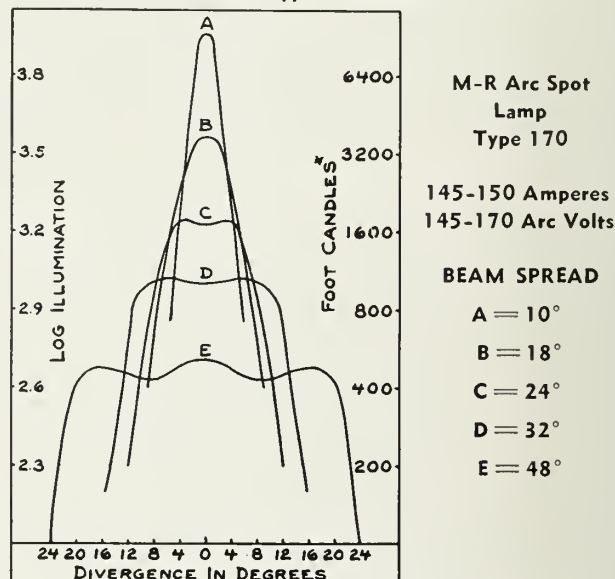
Spectral Curve of C. P. Mazda Lamps at 3380°K
When Used With LOF Technicolor Filter



Data by General Electric Co. Nela Park Eng. Dept.

LIGHT DISTRIBUTION OF LAMPS

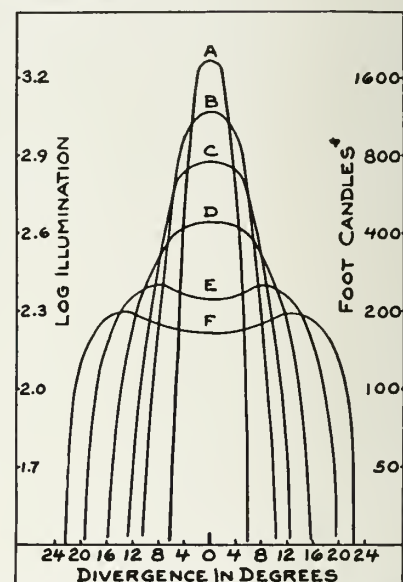
Light Distribution of Typical Spot Lamps Using Fresnel Type Condensers



M-R Senior Solar Spot
Type 214
5,000 Watt, G-64
Bi-Post Mazda
Globe

BEAM SPREAD

- A = 10°
B = 20°
C = 24°
D = 32°
E = 40°
F = 44°



*Photometer readings taken at a distance of 25 feet from the centre line of lamp pedestal. Data by Mole-Richardson Co.

people in these branches of picture-taking, has just been published by the C. F. Goerz American Optical Company. Among the lenses listed is the famous wide-angle Dagor Double-Anastigmat, which made its debut in the photographic world 46 years ago. Other lenses, all made in their New York factory, include the Super-Dagor, Dogmar, Apochromat-Artar, Gotar and Kino-Hypar.

New Emulsions Tested

Tests are now being made on the major lots of DuPont's new fast XL Pan, which also has recently been made available to amateurs in rolls for miniature cameras. Several types of emul-

sions with higher speed ratings but preserving all other qualities of Superior Pan are being tried out. Another new DuPont film being tried out, is as yet un-named special duplicating film for variable area recording prints. It offers high contrast fine grain and tests have shown it several db quieter.

Numbered Film Packs

Individual films of all Agfa film packs now are being marked with consecutive numbers from one to twelve, corresponding to the number on each film tab. This feature provides positive yet simple identification of every film pack negative. All Agfa Superpan Press film packs carry this number.

Similarly marked are all Agfa Super Plenachrome film packs with an expiration date of April, 1939, or later, and all Agfa Superpan film packs with an expiration date of January, 1939, or later.

Unbreakable "Glass"

Lucite, new transparent, non-breakable resin product from DuPont is currently the object of interesting experiments by studio prop departments in making ornamental lighting fixtures and costume jewelry. The new product, just available, is reported to offer unusual possibilities, since it is more transparent than glass and virtually unbreakable.

Camera

JONES'

PEOPLE



Universal studio still department chieftain gives views and pointers on capturing stellar personalities for exploitation value portraits.

It is more than 16 years since I began to photograph a seemingly endless array of the most beautiful and talented women in the world for motion picture purposes. This, in addition to the fact that I have been equally busy transposing to the negative their stellar male counterparts in filmdom.

These photographs have been distributed to all parts of the universe, in every form of publication, and still the public demand for them seems to be insatiable. The reason for this, perhaps, lies in the fact that in the mind of every beholder there is an ideal of beauty which can never be found in the busy activities in every day life. Hence we

turn to the screen and its luminaries, hoping to discover in their pictorial presentation the elusive qualities which have brought them fame and fortune.

But each time that I focus the camera I find a new problem confronting me, for the portrait photographer is not only required to reproduce the vivid coloring, the sparkling eyes and infinite grace of the majority of these subjects, but also must strive to bring out the spirit and personality that are hidden beneath the lovely mask of flesh.

For months now I have been endeavoring to record the personality that is an integral part of the fresh girlish beauty of Deanna Durbin. Yet at each sitting,

she reveals to me unsuspected depths of character and charm, vivid flashes of light and life which one can only hope to capture by means of the camera.

Even greater problems confront one, when the sparkling and vivacious Danielle Darrieux comes into the portrait gallery. Here indeed is an enigma for the photographer, for the great French star can never be found twice in the same mood. Hence, there is a bewildering variety in her portraits, and a consequent insatiable demand on the part of the public for new presentations of her.

In addition to these great headliners of the screen, we are confronted daily by such spectacular and diverse beauties as Gail Patrick, Nan Gray, Dorothea Kent and Barbara Read—each as different as day and night insofar as photographic angles are concerned.

Our difficulty lies in the fact that each and every screen star requires a different

kind of treatment. The first problem is to dissect their personality and win their confidence. They must have a feeling of repose when they face the camera, must feel certain that you will not depict them against a background which is not in keeping with their characteristics. Real photography bares the "ego" of the subject and you must first determine what this ego really consists of and then endeavor to present it in its most pleasing aspect.

If you succeed in doing this, you win the confidence of your subject, and at each sitting you find it easier to bring out the elusive beauty of mind and spirit that you have been seeking.

For instance, Darrioux is glamorous, and must be presented in that manner; Gail Patrick is of the regal type, while Deanna Durbin is in that transitory stage that reminds one of spring days and April showers. Therefore, pictures of Miss Patrick reveal her repose, intellect and sophistication; those of Darrioux her glamour and sparkling gayety, mixed with her tremendous sense of sardonic humor; while those of Miss Durbin, if you are fortunate, reveal the suppressed fires of budding genius that are likely to explode, from a camera viewpoint, in any direction.

It is all most fascinating, but of one thing I have become thoroughly convinced. That is, that the fads and passing fancies of "freak" photography will never stand the acid test of time. Beautiful, artistic portraiture will live on, for it is the one medium that will always give complete satisfaction to both subject and public. The reason for this is that it is an exact reproduction of life itself and presents its subjects in attitudes and poses that they would normally assume in real life.

Action pictures, so-called, have their place in the world of photography, as do the miniature informals which are now all the rage, but they do not have the depth of color, the proper background effects which can only be obtained in the portrait gallery.

If I were asked to set down a few rules for a successful portrait sitting I would name these things as the absolute essentials:

First, that all poses must be in keeping with the dramatic background that each subject occupies in the scheme of life;

Second, that the photographer must have a thorough knowledge of the characteristics and mental attitude of the subject;

Third, that the background must be in keeping with the general coloring or "aura" of each individual who faces the camera;

Fourth, that there must be a feeling

of mutual confidence and lack of restraint between the photographer and his "victim."

It is all important that the personality of the subject shall be released from its usual confines. We all of us carry a mask to hide our real thoughts. The days when we asked our subjects to "look at the pretty birdie" are long past. Instead, we must exhibit a genuine sympathy and understanding of those who pose for us; learn to understand their needs and desires, their moods and modes and thus capture the "mental flashes" that continually come and go as they face the lens.

Above all, portraits should never be

attempted when the sitter is under great nervous stress. Instead, one should wait until the combination of a calm mind in a calm body is attained—then it is possible to bring forth and highlight the major emotions in their most attractive form.

We are presuming, of course, that the most up-to-date equipment is being used, as it is in all modern, major studios. Each day the strides of science bring forth some new refinements in photography. We have better lighting, better films, better lenses, and, we, the technicians, must progress with them or go into the discard.

RAY JONES, Local 659, IATSE.

The Basis of Color Stills

Introductory article of a practical series on the principles and methods of color still photography aiming at good work within reasonable costs.

In the last few years color has made amazing progress. Statistics show that advertising in color has increased sales as high as 700 per cent since the public is becoming more and more color conscious. Motion picture production in natural color is increasing yearly. Mickey Mouse is color-minded entirely. Many experts believe the time will arrive when black and white photography will be replaced by color entirely; just as sound forced the silent picture out.

However, color stills are at present regarded as too intricate; too expensive and not advanced enough to permit being done at reasonable cost. This reminds me of a remark made to me of Carl Laemmle which I first encountered some eleven years ago, and which is quite true. At that time I had just entered Universal Pictures under his supervision. I was impressed by a big sign facing me as I entered through the main gate on which was written in big letters: "IT CAN BE DONE—CARL LAEMMLE, SR.," which is my own whole-hearted opinion. We *can* do it—we can solve color still problems, through intelligence and cooperation.

Color still processes were discovered years ago. Virtually every material needed to produce color today is on the market. The only thing needed to produce color *correctly* is the experience and knowledge in the technique of color photography—and that, we are not able to buy. Natural color photography is sweeping the country, and color photographers are popping up everywhere like dandelions on the front lawn. Color cameras are bought—color films, every imaginable piece of equipment, gadget, and incidental which, according to catalogues, one cannot afford to be without—and we think we are ready to shoot color; not

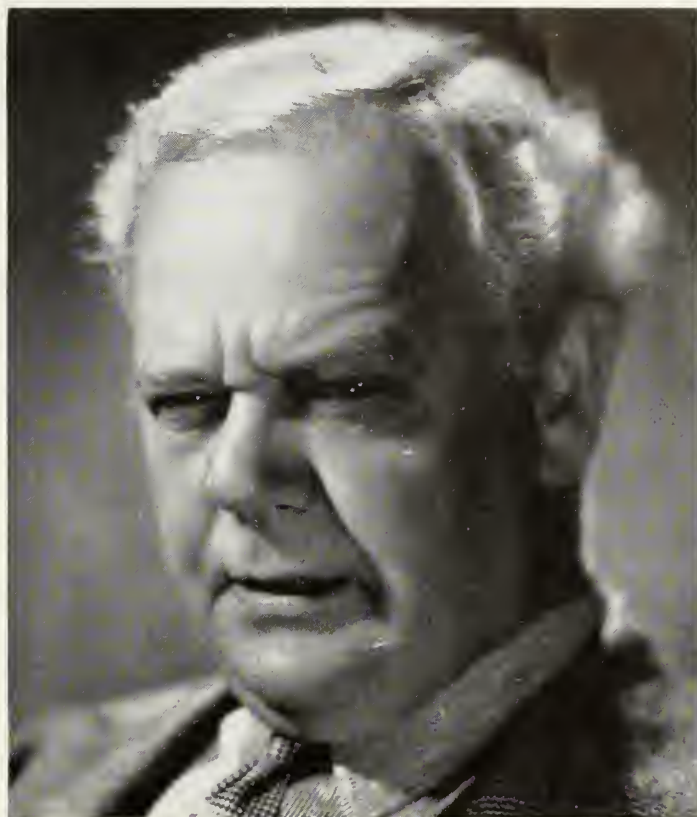
suspecting the painful experience ahead—the traps and pitfalls which might spell failure. Color is such a little word, but how much sorrow it can cause, simply because we won't follow the rule of nature that "we have to learn how to walk before we can run."

Color photography, even more than monochrome photography, is a complicated process belonging to the graphic art; both having limitations. In color, just as in sound, recording accurate work and knowledge are most essential in order to reproduce successful results. But we can't stop here—in order to be a good technician of his trade every craftsman should at least know the composition of the things he is working with as well as their limitations. Also, a good technician should be so thoroughly familiar with his materials, that should trouble arise, he would be able to solve his own problem. It is an accepted fact that we are not able to get more out of any one thing than it is capable of producing. In other words, "You cannot make a racehorse out of a cow."

What knowledge I have gained in color photography in the past ten years was obtained in various ways; a good part of it by the trial and error method. I also got quite a bit of useful information and leads from the many books written on color which supplied me with connecting links.

This article is written mainly for beginners interested in color, to help them lay the foundation of the important factors involved in producing color correctly and successfully. Detailed discussion of particular phases will come later. The main factors to be familiar with before attempting color work are:

1—Knowledge of the light quality in relation to the spectrum;



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2—Knowledge of the light sensitive surface—the emulsion—and its limitations;

3—A decided knowledge of color in regards to color harmony, for there is nothing so disturbing in an otherwise beautifully lighted picture as bad color harmony.

Books on all of these points can be had in the library. Particular volumes

will be cited later in this series of articles.

Inasmuch as color depends entirely on the light condition, it is of great importance to the color photographer to understand light. The quality of light is also of great importance when projecting color; the light source should be of such quality as to produce the best results. Any light can be analyzed with

the spectroscope, a discovery made by the scientist, Clark Maxwell, who advanced the theory that all color in nature could be matched by proper admixture of the three primary colors selected from the spectrum.

The source of color is light; without it, natural or artificial, there could be no color. Everything we are able to see is visible; either because it is self-luminous,

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like the sun; or it reflects light falling upon it, and is non-luminous. The greater the reflecting power the brighter it will appear. Daylight is preferable to any other light, but even here there are only a few hours during which conditions are favorable. The actinic quality is changing constantly, and as light characteristics change, so color values change, and compensation by light filters is necessary.

Incandescent light if of no great value due to the fact that it is too low in intensity to permit sufficient speed in color photography to insure satisfactory results. Speed in exposure is greatly reduced by color taking screens in the emulsion, screen plates, filters and mirrors as in one-shot cameras, and other devices needed for color. Hence, a considerable increase in light is necessary or large lens openings and long exposure inevitable. This not only decreases sharpness and depth of the picture but often results in poor quality. I have found the best dependable light for all around work to be the high intensity Arc-light or Photo-flash; both of them requiring slight filter compensation, while permitting the use of small stop openings and speed.

The camera and the eye are of similar construction. However, the eye with its long range of sensitivity to light and its facility for adapting the iris, sees high and low illuminated areas in full detail; while the photographic light sensitive surface recording the half-tones in their delicate gradation are subject to strict limitation. The range that they cover is very short, and any attempt to extend that range will lead to failure.

Since all color can be matched by the proper admixture of the three primary colors, it is of utmost importance that care should be taken in making color negatives. Consideration should be given to proper lighting, exposure and proper development. Weakness in any of these points will completely nullify all efforts to reproduce color correctly. From the many questions that have been asked me, I judge that the general tendency is to overestimate the speed of the color-camera and also the range of the emulsion. Do not believe the camera is capable of duplicating the eyes' feat of recording shadow and highlight detail simultaneously, for under no condition is this so. Contrasty lighting, under and over exposure, are dangerous. It is folly to believe that speed can be gained by using dynamic developers and thus to produce satisfactory negatives. Great care should be exercised to keep exposure and developing time consistent to minimum values, in order to arrive at the contrast and shadow detail desired. There can be very little juggling around. However, there is some latitude, and one should try to stay within ten per cent limits.

Excellent color prints can be obtained

with a minimum amount of effort from negatives containing full density range, which are free from fog and aberration. I have found borax to be an excellent developer. However, there are many others, varying in composition and developing characteristics. All manufacturers of photographic emulsions will give, on request, information as to the development of their product, what type of developer to use, and the correct developing time in regards to gamma. But this of secondary importance. The important factor is density range. Color can be photographed in any key, as long as one stays within the range of the emulsion and does not try to stretch it beyond its capacities. This contradicts the many statements that color must be photographed with flat lighting.

The essential factors for good color in stills are familiarity with the camera, its speed, the range of the emulsion, the lighting, and correct development by tests.

You will also find that the type of light used will make a great difference. Let us assume that we have produced a set of color separation negatives which leave nothing to be desired in printing quality, cleanliness and balance. Even these will need correction if correct color reproduction is expected. Pure color is needed. The best color pigments obtainable at present are not correct, since pure color mixed with foreign matter, gelatine or other substances, will not transmit or reflect its correct value. This makes it necessary to correct the negatives.

The technique in making the three continuous tone positives differs from the regular monochrome printing. What is needed to know is continuous full-range, half-tone positives. We know that all neutral tones like gray are represented as of equal strength in the color separation negatives. A good way to familiarize oneself with this is by using a regular black and white negative. From this make a normal print and reproduce same by using three continuous half-tone positives which, by employing the three primary colors, should equal the original. This procedure will show you what continuous half-tone positives should look like. It is of importance that you adjust yourself and work in such a range that all steps are under normal conditions. Slight corrections can be made if the negative should be a little too contrasty or too soft, without changing developer or developing time.

Considerable time and effort is involved to make color prints from poor negatives; and for engraving purposes much staging and re-etching is necessary in order to reproduce correctly and this brings up the cost to such an extent that color printing will be prohibitive. Light and expose your negatives correctly and do

not expect the laboratory to perform miracles.

Insiders in successful color work in the graphic arts know that many fine pictures have been made in the laboratory and the engraving plant, and not by the photographer. The ideal situation is a combination of well exposed negatives with accurately controlled standardized processes in the lab so that the engravings or off-set plates can be turned out also with smoothness and standardized efficiency. Retouching and re-etching can be done successfully by experts, but they require work that is ultra-fine and exact. That means higher costs.

Future articles will take up various phases of the subject and it also is planned to have experts in various fields, particularly from the manufacturing companies, contribute informative discussions of particular angles of color still work.

CHARLES HOFFMAN, Local 683, IATSE.

Notes on Progress

New Eastman cut film and light metal 8x10 camera tested by Wanger publicity and still experts.

The most provocative article on studio still photography in recent years was the thorough analysis of the situation by John LeRoy Johnston, veteran studio publicist, and now publicity director for Walter Wanger Productions, in our September, 1937, issue, in which Mr. Johnston envisioned a new type candid 8x10 metal camera for studio still work. Since publication of the article, fast new cut films have appeared, the latest being Eastman's Super-safety Panchro Press, and a new camera has been designed by Gordon Head, member of Local 659, IATSE.

Notes on these new developments from Mr. Johnston and the United Artists still department experts are contained in the following communication to the editor, received just on the eve of going to press (the new Eastman film was first used in Hollywood in these experiments.) Technical details on the new film and the new camera will appear in succeeding issues.

Dear Ed:

The tests which Gordon Head has been making on the set of Walter Wanger's "Algiers" are most interesting and encouraging but far from fair to either Head or his camera.

First of all, the tests were made on a high and narrow Algerian street set where James Wong Howe, in keeping with the spirit of the story, was forced to maintain a heavy shadowy lighting effect and the best still pictures had to be given double the exposure that is normal, whereas Mr. Head was trying his camera at regular candid camera speeds to give it the most severe tests possible. Furthermore, on the three days that Mr. Head was on the set the

action was not conducive to his best results.

However, these things I am happy to note and to call to the attention of the craft. Mr. Head's camera affords many advantages we feel candid cameras should have, namely:

(1) the ability to make an 8x10 negative permitting retouching when necessary, and contact prints of standard size without the necessity and weakening of enlarging;

(2) although larger than any other camera, it is built so lightly that it can be held in the hands steadily;

(3) it has a reversible back, allowing shifting from panorama to upright pictures more easily accomplished than on the present standard equipment.

Besides, he has built in stereopticon focus on the camera, which is unique and an improvement, a shutter speed of 1/2000, and with certain minor corrections his exposure (shutter) curtain can be made absolutely silent, giving his camera the effectiveness of a speed graflex in a handy "blimp." The experiments made for us clearly indicate that what Head's camera has not yet overcome in optical correction is compensated for in the speed of the new Eastman Super-safety Panchro Press for which Mr. Head and our own Bob Coburn have been the first to introduce in

4x5 and 8x10 sizes in Hollywood. This fast film has been checked by Mr. Coburn, Mr. Don Keyes and Mr. Charles Bulloch of the United Artists still room, all of whom attest its great value, its laboratory handling and reproductive quality.

Both Mr. Coburn and Mr. Keyes will use the 4x5 Eastman Panchro Press exclusively in their fast action graphic and graflex work hereafter.

We hope, in the near future, to have more active sequences than those photographed on the Casbah set recently, at which time it will be our pleasure to have Mr. Head make further experiments.

If so-called candid camera pictures can be made large enough to permit contact reproduction in quantity, many of our present publicity and lobby still problems will be solved, and I think all publicity men should encourage such experiments, hopeful that a practical new candid camera for making action stills (without interference with production) during the filming of movie scenes, can be produced for general Hollywood service.

I want to thank you and your magazine for assisting and encouraging such progressive still photography.

Sincerely,

JOHN LeROY JOHNSTON,
Director of Publicity.

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News of the Month

SMPE Session Papers Outstanding

Semi-annual convention of Society of Motion Picture Engineers in Washington features best collection of papers in recent years on technical progress.

Spring convention of the Society of Motion Picture Engineers, April 25-28, at the Wardman Park Hotel, Washington, D. C., revealed the most extensive and interesting array of technical papers in recent years. As is International Photographer's custom, we present herewith abstracts of the papers presented, but due to lack of space, only abstracts presented during the early days of the session appear in this issue. The balance will be published in the June International Photographer.

Report of the Progress Committee; J. G. Frayne, Chairman.

Outstanding event in cinematography during past year was development of high-speed panchromatic emulsions by Agfa Ansco Corporation. Other interesting advances in emulsion field are development of two fine-grain duplicating film stocks by Eastman Kodak Company. Of interest also is new sound emulsion developed by Dupont in which periodic variation in sensitivity brought about by present emulsion-drying methods has been eliminated.

In sound-recording field, items of interest are introduction of linear decibel volume indicators by United Artists Studio and introduction by RCA of modulated high-frequency method of determining optimal processing conditions.

"Sound Stages and Their Relations to Air-Conditioning";

C. M. Wert and L. L. Lewis, Carrier Corp., Syracuse, N. Y.

Development and growth of modern motion picture sound stage has almost paralleled that of sound pictures. Weather and advancement of lighting technic undoubtedly brought about original need of enclosed stages. Advent of sound recording brought about requirements not originally considered. Modern sound stages have increased not only in quality but in size. Modern sound-stage must have structural strength to withstand the elements, including earthquakes. It must meet requirements of set construction, sound-proofing and occupancy. Sound treatment makes necessary other treatment for satisfactory occupancy. Lighting on sound stage is greatest contributor of heat gain within the stage. Lighting is variable as to amount and duration, must be controlled correctly. Size and number of sets are very variable and create their individual problems. Both number and types of persons present on a sound stage play their parts in the relation between air-conditioning and the sound stage.

Construction that retards flow of heat in either direction through walls necessitates the addition and removal of the

heat. Lighting on a sound stage is of such magnitude that its effects must be removed. High-salaried personnel often in costume, demand comfort while working. Management is obviously economically in better position if personnel is comfortable; less time is lost due to make-up retouching and less delay brought about by perspiration dampened costumes.

An air-conditioning system should have the ability to provide heating, cooling, ventilation and cleaning. Heat in the air rising to top of the stages should be removed by an exhaust system. Stages are generally maintained at 75 degrees Fahrenheit and 50 per cent relative humidity, with temperature settings above and below at option of the occupants. Floor distribution of air has advantage of more economical removal of rising heat but has the practical disadvantage of placing set construction and personnel too near source of cooling. Overhead distribution has the advantage of better temperature distribution but is less economical in removal of rising heat from lights.

Sound treatment of an air-condition installation is necessary for continuous operation of system. If system does not operate continuously heat load builds up to point where system can not adequately regain comfortable conditions during non-shooting periods. Treatment is accomplished by both isolation and absorption of generated sound, and can be so accurately determined that a guarantee of the increase in noise level can be given in decibels and in relation to frequency ranges.

"Documentary Film Study—A Supplementary Aid to Public Relations";

A. A. Mercey, School of Public Affairs, The American University, Washington, D. C.

Documentary films are proving of increased importance as a factor for informing and mobilizing opinion. Marked success of two U. S. documentary films, "The Plow That Broke the Plains" and "The River," both written and directed by Pare Lorentz, has focused new attention upon this type film. The school

of Public Affairs of American University conducts an "in-service" training school for government employees where-by registrants obtain instruction in courses and subjects from experts in various Federal departments. Included in curricula are series of courses on public relations. The film as a factor in public relations is an important one. In answer to requests for some information and instruction in this new field, a course in "Documentary Films Today" was instituted.

Film course included eight-week study with screenings, film analyses and discussions conducted by visiting experts in film-making and film use. Subjects covered were: the newsreel as contemporary historian; the "March of Time" as a document; federal, educational, and scientific films; U. S. Government documentary films; documentary aspects of Hollywood films; foreign documentaries; industrial, sales, and domestic propaganda films.

In addition to regular film discussion and study, a number of reports were made on documentary film activities. Among the most important was one on a federal film survey. For the first time, a complete survey of all U. S. government films is being made that will compile in one place the data on motion pictures. A standardized type of procedure was outlined.

"Good Tools Pay for Themselves";

J. R. Prater, Congress Theatre, Pabouse, Washington.

Average projectionist does not equip himself with an ample supply of good tools, and average theatre management refuses to stock projection room with anything more than a scant supply of tools of poor quality. After listing tools that are known to be useful in projection room paper points out that were such tools available to projectionist they would return their original cost in relatively short space of time by enabling proper testing and alignment of equipment in addition to facilitating minor repairs.

"The Determination of Correct Exposure in Photography";

L. A. Jones, Kodak Research Laboratories, Rochester, N. Y.

Many treatments of this subject, some dealing with certain specific phases, and some fairly complete, are to be found in various textbooks and scientific journals in the field of optics and photography. In spite of this, however, there seems to be some uncertainty in the minds of some relative to the correct manner of dealing with the problem. This paper is distinctly of a tutorial character, an endeavor being made to present the problem in a clear and systematic fashion. Much of existing confusion is doubtless due to multiplicity of photometric units found in literature of photometry, and to a certain amount of ambiguity in current definitions relating to these units. Attempt is made

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BIG PICTURES. *In a period in which virtually every hit story is seeing its umpteenth remake through a serious shortage of original new story ideas, an especially interesting remake is that of Philip Barry's "Holiday," originally starring Ann Harding for Pathe, and which Columbia now releases with Katherine Hepburn and Cary Grant co-starred, directed by George Cukor. An excellent supporting cast includes Doris Nolan, Lew Ayres, Edward Everett Horton, Henry Kolker, Blanche Barnes, Jean Dixon and Henry Daniell. The story opens at Lake Placid and features both strong emotional drama and amiable comedy in working out the complications of the young lawyer (Cary Grant) engaged to the daughter (Doris Nolan) of a stuffy Social Register family with millions. Black sheep of the family for her unconventional but natural ways is the sister (Katherine Hepburn) who, in a role that is particularly suited to her acting talents, eventually wins Grant when he finally rebels completely against the smug pattern of the Seton family. The well-composed and finely handled production stills on these pages are by Alex Kahle, member of Local 659, IATSE. Photography was by Frank Plauer, film editing by Otto Meyer and Al Clark, art direction by Stephen Goossou and Lionel Banks, musical direction by Clifford Broughton, and Lodge Cunningham, member of Local 695, IATSE, was sound engineer. The picture was produced by Everett Riskin.*



to present a considerably simplified conception of the minimum number of photometric quantities required for dealing with the exposure problem. Relation between image illumination and object brightness is dependent upon several physical characteristics of the image-forming system. Quantitative information relating to specific image-forming systems and a general average image forming system useful for computing relation between object brightness and image illumination are given. Relation of sensitivity of photographic materials to problem is considered in some detail, as well as photometric and contrast characteristics of various types of photographic subjects.

"Latent-Image Theory and Its Application to Low-Intensity Photographic Exposures";

W. J. Albersheim, Electrical Research Products, Inc., New York, N. Y.

In previous paper by the writer, it was shown that photographic exposure characteristics are in agreement with assumption that a photographic grain must absorb two photons of visible light in order to become developable. In this paper, theory is compared with recent physical research by other authors. It is assumed that a film grain is "sensitized" by the first absorbed photon and fully "exposed" by the second absorbed photon.

Reciprocity-law failure at low-intensity exposures can be explained by the assumption that sensitized state of film grains is unstable and that number of sensitized grains decreases with time in an exponential manner unless fixed by activation. The half-time of this fading for certain emulsions is deduced from Kodak publications on reciprocity-failure characteristics.





Edward Everett Horton, one of the industry's most popular comedians, depicts sorrows and joys of a public

Conclusions from this theory are drawn with regard to the contrast improvement for low-intensity photography, such as astronomical work or newsreel photography under unsatisfactory lighting conditions; by pre- or post-fogging. Theoretical conclusions are checked with test results.

"Effect of Aeration on Photographic Properties of Developers";

J. I. Crabtree and C. H. Schwingel, Eastman Kodak Co., Rochester, New York.

Unseasoned elon-hydroquinone developers of relatively high alkalinity (pH 10.0 to 10.5) showed a rapid decrease in activity after aeration for 1½ hours while elon-hydroquinone-borax developers of low alkalinity (pH 8.4 to 8.8) showed increased activity (due to the liberation of alkali resulting from oxidation) which then remained constant for prolonged periods.

In general, alkalinity of developers containing hydroquinone increased on aeration, while those containing only elon showed little change.

Practical tests with processing machines equipped with air agitation devices have shown that very constant developing conditions can be maintained with both positive and negative type of developers.

"Solution Agitation by Means of Compressed Air";

C. E. Ives and C. J. Knaz, Eastman Kodak Co., Rochester, N. Y.

In development of motion picture film, developer in emulsion undergoes exhaustion and thereby loses activity. Agitation of developing solution in vicinity of film is required to assure sufficiently rapid and uniform renewal by relatively fresh developer brought from the remainder of bath.

This paper is concerned with method of bringing about agitation by means of compressed air which is released at one or more points in developer, through which it rises to upper surface creating generally turbulent condition and setting up rapid streaming effects.

Effectiveness of stirring is limited by tendency of induced stream to form a narrow channel in one portion of tank with relatively low velocity in remainder of tank.

Various means have been tried in an effort to direct rapidly moving stream along film surface, and this was accomplished by means of gridwork of conducting pipes extending from top to bottom of rack and parallel to sides of racks. Tests for uniformity of development made by means of uniformly flashed film showed benefit conferred by various improvements in control of agitation. Dimensions and details of construction are given for making up distributing grid.

"Maintenance of a Developer by Continuous Replenishment";

R. M. Evans, Kodak Research Laboratories, Rochester, New York.

By a series of simple assumptions that do not depart appreciably from current practice it is shown that concentration of any ingredient in a developer solution that is continuously replenished during use may readily be calculated. The equations for the equilibria and rates of growth of various substances are derived and application is made to a practical case. Benefits of chemical analyses for developer constituents both for maintenance of quality and for economy are pointed out, and analytical methods published by Lehmann and Tausch are briefly outlined.

"The Effect of pH upon the Washing of Processed Films";

S. E. Sheppard and R. C. Houck, Kodak Research Laboratories, Rochester, N. Y.

Advantage stated to be obtained by adjusting fuming baths and wash-water to isoelectric point of gelatin have been claimed. Advantages are said to be shorter washing time, less swelling and retention of water, with consequent improvement in jelly strength of wet emulsion, and reduced drying time. In this investigation conditions as to pH of solutions, and wash-water, rate of flow of water, residual thiosulfate, etc., were controlled accurately. Results indicate that with regular acid fixing and hardening bath (F-25) there is no advantage, but rather a disadvantage in washing at isoelectric point (ca pH 4.9) rather at pH 7 to 8, since time required to remove hypo to same degree is increased, nor is less water retained.

In non-hardening acid fixing bath, there was little difference in washing time, but some gain in drying time for isoelectric wash because of reduced water absorption.

"A New Densitometer";

H. Neumann, Klangfilm G. m. b. H., Germany.

Density measurements of variable-width sound records should cover a large range of densities, and measuring area should be as small as possible, to make it easy to find suitable area on normal sound records.

Densitometer described, intended mainly for use in studios and laboratories but it is accurate it may be used also for scientific research, is capable of measuring densities of 0.01 to 2.5 of areas 2.5 mm. long and 0.03 mm. wide, limited by mechanical slit. Absorption of light by object is determined by means of current set up in blocking layer photoelectric cell which is measured by very sensitive galvanometer giving direct density readings. Calibration of light-source can be checked very simply by separate light path without making necessary removal of object during the check. Special arrangement is provided for visual observation of measuring area.

Density values are determined with parallel light, and from these data values for diffuse light may be easily calculated.

"The Transmission of Motion Pictures Over a Coaxial Cable";

H. E. Ives, Bell Telephone Laboratories, New York, N. Y.

Transmission of television signals over wire lines number of years ago used signals corresponding to images of coarse detail, and required frequency bands accommodated by existing types of circuits. Television images now considered necessary correspond to frequency bands of greatly increased width, and will require special wire networks and transmission means.

Coaxial conductor recently in operation for experimental purposes between New York and Philadelphia can transmit band of frequencies of approximately 1000 kc. While designed primarily for multiple telephone channels, it offered possibility of transmitting a



Whitey Schafer, Columbia still department chief, and member of Local 659, IATSE.

single wide band as required for television.

Experiment consisted in providing television-type terminal apparatus for producing signals falling within available band, and of developing and utilizing methods of transmission that would make most complete use of frequency band available. For convenience in experimental work, signals were generated from motion picture film. Film was scanned mechanically by means of lens disk containing 240 lenses. It was moved continuously at 24 frames per second, and its motion, together with motion of lenses in disk, swept each frame of the film in 240 juxtaposed lines. Light passing through film was received on photosensitive surface; resulting photoelectric current was amplified and by means of modulating and demodulating apparatus transmitted as single sideband lying between approximately 150 and 950 kc. At receiving end single sideband signal was restored as signal from zero to 800 kc.

For reception, special cathode-ray tubes were used in which particular attention was paid to definition of spot and linearity of response. Synchronism between the two ends was obtained by sending single frequency over separate channel and using it to operate sweep circuits at receiving end. Use of mechanical scanning and high-definition receiving tubes resulted in pictures of very satisfactory quality within limitations set by the frequency band.

"The Inter-Relationship of the Various Aspects of Color";

L. A. Jones, Kodak Research Laboratories, Rochester, N. Y.

An understanding of subject of color and color measurement involves knowledge of many and diverse phenomena. Pursuit of this knowledge leads into many fields of physical or objective science, such as physics, physiology, biology, chemistry, etc., as well as into domain of a subjective science, psychology. While it may not be possible or even desirable to attempt to draw sharp lines of demarcation between all various aspects of the problem, it does seem desirable, for sake of orderliness and clear thinking, to

suggest certain divisions of the subject into few definite categories and to attempt to define relations that exist between various aspects of problems as a whole.

This paper is designed largely as means of establishing orientations in general field. Attempt is made to develop logical and unambiguous nomenclature that will enable us to discuss various aspects of the subject without confusion that exists so generally at present time when individuals of diverse trainings and viewpoints attempt to discuss color. Subject-matter divides itself rather logically into three clear-cut categories, which may be referred to as physical, psychophysical, and psychological. Attention is drawn to relation existing between correlated aspects in each of these categories. At-

tempt is made to clarify purely physical factors involved and to discuss certain sensory and perceptual aspects of color and relations existing between them and their physical and psychophysical correlates.

"The Educational Value and Preparation of U. S. Army Training Films";

R. T. Schlosberg, Capt., U. S. Army Signal Corps, Washington, D. C.

Problems encountered, considered incident to preparation of army training films, and teaching principles and their application to instruction through medium of sound-films are discussed. Method employed and criteria for selection of subjects are outlined, as also general method by which such film subjects are produced.

News Reels

Spot News Half a Mile Down

Movietone crew goes into the earth to cover amazing story of engineering genius in driving the new Aqueduct from Colorado to Southern California.

When millions of dollars and miracles of engineering skill are being expended to bring water across the State of California from the Colorado River to 13 Southern California cities, that is prime material for the newsreels. We covered the Aqueduct work recently because Movietone News Cameraman Al Brick decided that the Mt. San Jacinto tunnel of the project would make a good newsreel yarn, and the experience and the story were worth the trouble.

A small army of determined men are relentlessly pushing this series of canals

and pipe lines closer to the Los Angeles area, and one of their toughest assignments has been the Mt. San Jacinto tunnel. In planning for the Aqueduct, which will carry a billion gallons of water per day, the engineers picked a route that was most free from geological hazards. It is 392 miles long, but requires the boring of five tunnels.

Mt. San Jacinto has put up the stiffest resistance against being tamed by man, and when Brick decided to take his camera down into the bowels of the earth for a first-hand film I tried to convince

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him that I would be much happier just reading about it; but off we went on the assignment.

Being distinctly not of the hard rock type, my trip to Banning, California, was a mixture of forebodings and hope—hope that somehow it wasn't a story. My first introduction to Bill Fox—he's superintendent of photographic records for the aqueduct—and right now I put my vote for him as one of the most versatile photopraghers in the business. Bill's enthusiasm is catching and when we started out for the construction camp I rather felt that maybe it wasn't such a bad job after all.

Our next meeting was with Superintendent of Construction John Austin which practically put me in a "rarin' to go" mood. Austin is one of those tall, lanky, genial types that you talk to for five minutes and come away saying "What a swell guy." Indeed, at the end of the day I felt that I could use the plural sense and still not be exaggerating the least bit.

Austin explained that the tunnel was being bored from four different locations on Mt. San Jacinto. Each bore starts with an addit, or entrance tunnel, to bring you down to the level of the main tunnel. At the proper level excavations are made in both directions and eventually the four main tunnels will be joined.

From the very beginning this sleepy old mountain has resented the intrusion. She has retaliated with one of man's most destructive forces, water. Hundreds of thousands of hidden springs flood the tunnel at a rate varying from 7000 gallons per minute up to 25,000 gallons per minute. Estimated cost of this tunnel has already skyrocketed from eight millions to twenty millions of dollars. Conceive if you can, the infinite study and application that the Aqueduct System has made to employees' safety which has allowed work on this tunnel to progress over a period of five years with only one fatality.

After a visit to the stock room, we lumber back to the muck cars (our only means of entrance and exit) outfitted in hip boots, heavy raincoats and hard hats. With all our camera equipment safely wrapped and loaded on the car the operator touches an overhead wire with a metal contact and thus relays the go-ahead signal to the control man. We start the speedy descent down to the main level. This is the Lawrence addit and is the longest one of the system. It plunges into the heart of the mountain at a 25-degree angle for a mile-and-one-half. We rush headlong into an inky blackness which is relieved only by a little chain of lights strung along the side wall and I think of the times when as a little boy I used to ride the front car of the subway train and experience the same sort of thrill.

The car we are riding is used to bring



Top, left, Movietone News records meeting of John Austin, superintendent of construction (with hat off), and Thaddeus Merriman, consulting engineer on Aqueduct project; top, right, Al Brick, member of Local 659, IATSE, and the author, Warren McGrath, member of Local 695, IATSE, loaded on muck car

for descent into tunnel; lower left, "action" half a mile underground; and lower right, at the "working head" miners battle to stem torrents of water rushing out of the rock face. All pictures are by Bill Fox, Metropolitan Water District staff photographer.

supplies into the tunnel and to take muck and debris out. It also furnishes transportation for the workmen. It resembles the popular conception of a mining camp dump car except that it is built on a special truck designed to keep the car level on the steep incline. A powerful steel cable wound on the largest drum in the world controls the movement of the car; but a safety dog drops to lock the car in position on the tracks should the cable fail.

In an incredibly short time we arrive at the tunnel level a half mile underground and are immediately conscious of the great battery of pumps that work tirelessly to keep the water at a workable level. Engineers in planning for the greatest possible emergency have installed a pumping plant with a capacity of 25,000 gallons per minute. These all-important machines are never left unattended. Should they fail the tunnel would rapidly fill with water and the

work of years would in a great measure be ruined.

This is an old story to Bill Fox. While I stand with mouth agape he is busy with his paraphernalia and in a few minutes, presto, a battery of flood lights go into action. These together with our camera equipment are loaded on a flat car and we enter the main tunnel. Instantly we are greeted with a downpour that can only compare with the recent flood storm at its worst. But the nonchalance of the hard rock miners is contagious and soon we are wading around knee deep in crystal clear water as if it was our daily stint. The main tunnel is 16 feet in diameter, large enough to accommodate a locomotive comfortably.

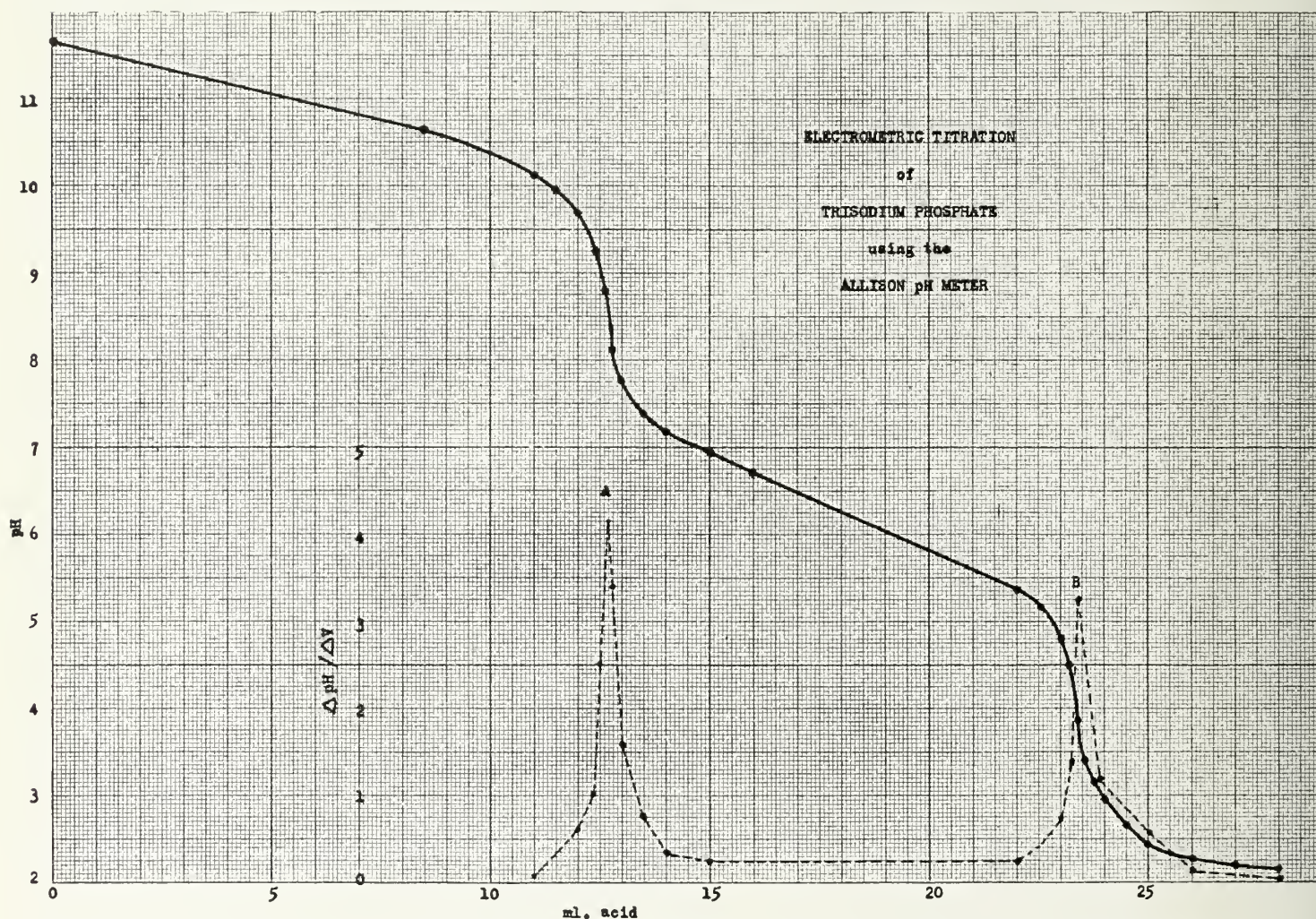
Perhaps you've seen these pictures in a recent edition of Movietone News and caught the thrill of this battle of man against nature. If you remember the shot of the timber work suddenly giving away under the pressure of another hidden

spring and torrents of water cascading out, let me say that there was nothing framed on this story. When those hard rock miners "dropped everything" and rushed in with emergency shoring it was the real goods. All in all, Al managed to capture the story in six hundred feet. He was hampered by the torrential downpour which ruined a thousand foot roll and caused many buckles. We both felt it was a good day's work to get the story at all. But, as I said before, what is "can't be done" on topside becomes "must be done" down under.

Anyway, early in 1940 when Mr. and Mrs. Southern California lift a glass of crystal clear Colorado water to their lips for the first time, let's remember to toast those hard headed, hard fisted, hard thinking hard rock miners who substituted the word "must" for "can't." As for your newsreel reporter—we'll probably be busy covering a baby contest.

WARREN MCGRATH, 695, IATSE.

Laboratory



Electrometric Titration Method

Technique for determining end-points of reactions described in detail: has wide range of application for accurately determining solution values.

Electrometric titration is the technique whereby end-points of reactions are determined electrometrically; *i.e.*, by means of electrode potentials. The method has a wide range of application, and may be used to accurately determine end-points of neutralization, oxidation-reduction, and many precipitation reactions. An application to which electrometric titration is particularly suited is the titration of colored or opaque solutions in which the usual end-point indicators cannot be

used. Likewise, solutions such as hypo may be adjusted to any predetermined pH value by this method.

In an electrometric titration, progress of the reaction is followed by measurement of the electrode potentials. Rapidity and ease with which these potentials can be measured with the Allison pH Meter now makes this method available to all scientific workers.

Procedure is to mount the pH meter in such position that the electrodes are

correctly immersed in the solution to be titrated. This will be facilitated by the use of extension electrode leads, whereby electrodes may be mounted directly in the titration beaker, or the pH meter may be mounted directly on the burette support stand.

If the Bio-Model pH Meter is used, add sufficient quinhydrone or Hydronol to the solution to saturate at the end-point. (For example, if the final volume will be approximately 100 ml., add 100 drops (5 ml.) of Hydronol, or 150 mgm. quinhydrone.) If the Industrial Model pH Meter is used, nothing need be added to the solution before titration.

Next measure and record the initial pH of the solution. Add a small amount (for example, 1.0 ml.) of titrant from the burette; stir, allow to come to equilibrium, and again measure and record the pH. Continue adding titrant and measuring the resultant pH after each

addition. As an end-point is approached, indicated by increasing increments of pH, decrease the volume of titrant added; however, this need never be less than 0.2 ml. for each addition. The full curve of Figure 1 shows the course of a typical neutralization reaction. The points indicated on the curve are successive additions of normal acid and the resultant pH values. It will be seen that the titration can proceed by large increments except in the region of an end-point.

The procedure for glass electrode electrometric titrations is the same as that given above; care should be taken that the electrode has reached equilibrium with the solution before the reading is made. Oxidation-reduction (redox) titrations are likewise performed as directed above, with the distinction that the gold electrode is used, and no quinhydrone or Hydronol is added to the solution.

Determination of End-point

The end-point of an electrometric titration is characterized by a sharp break in the titration curve, usually called the "point of inflection." This is a point of maximum slope, and may be located with a fair degree of accuracy by inspection. For example, the curve of Figure 1 shows two points of inflection which appear to be near 12.7 and 23.4 ml. of acid, respectively. Great precision in the location of the exact end-point may be attained by plotting increments of pH with relation to volume, or in other words, plotting the slopes of the various portions of the curve. To do so, the increment in pH produced by the addition of a given volume of acid is divided by the volume of acid added. If a change of 0.48 pH unit were produced by the addition of 0.2 ml. of acid, the corresponding slope would be $0.48/0.2 = 2.4$.

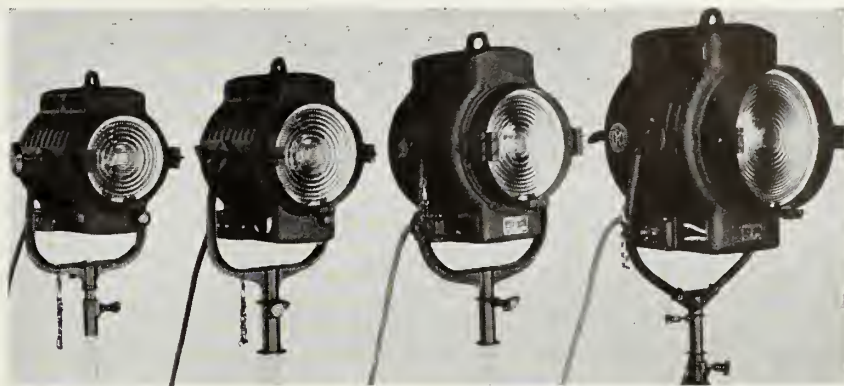
The slopes for the various portions of the full curve of Figure 1 are plotted as the dotted curve on the figure. Two perfectly defined end-points are shown: end-point "A" at 12.70 ml. of acid, and end-point "B" at 23.40 ml. of acid. Note that end-point "A" was established by extrapolation of the two sides of the cusp, whereas at end-point "B" it so happened that the end-point was exactly reached in one of the readings.

For the mathematically inclined, an interesting method for locating the end-points in electrometric titration is based on the assumption that the titration curve in the region of an end-point may be described by a cubic equation. Fenwick's formula for the end-point by this method is as follows:

$$V_{e.p.} = \frac{V_2 D - k D'}{D}$$


D

where V_2 is the second of four equidistant volume readings, and D and D' are determined as follows:



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Vol.	pH	First Diff.	Second Diff.	Third Diff.
V ₁	12.4	9.25	—0.50	
V ₂	12.6	8.75	—0.68	—0.18 (D')
V ₃	12.8	8.07	—0.32	+0.54 (D)
V ₄	13.0	7.75		

Since the constant increment k is equal to 0.2 the end-point volume is given by:

$$V_{e.p.} = \frac{(12.6 \times 0.54) - (0.2 \times -0.18)}{0.54} = 12.69 \text{ ml.},$$

which agrees with the result obtained by the method of plotting slopes.

The mathematical method is useful as a check against the more accurate graphic method, and in cases where coordinate paper is not readily available. The end-points of titrations in strong salt solutions, where the point of inflection is somewhat repressed, may be readily established by this method. It is recommended that when this method is used alone the end-point should be located by calculation from two sets of equidistant volume intervals, since the assumption of the theoretical cubic curve is not always found in practice.

Interpretation of Results

The following analysis of the results shown graphically on Figure 1 is typical of the interpretation of electrometric titrations. The data from which the figure was constructed was taken during the routine analysis of a sample of trisodium phosphate (dodecahydrate).

A point of inflection on an electrometric titration curve is an indication that a reaction has been completed. On the curves of Figure 1, point A is the end-point of the reaction converting the tertiary phosphate, (PO_4^{3-}) to secondary phosphate, (HPO_4^{2-}); and the point B is the end-point of the reaction converting secondary phosphate to primary phosphate, (H_2PO_4^-). If the sample had been pure Na_3PO_4 , the volume from end-point A to end-point B would be equal to volume A. However, volume A is greater by the amount, $(2 \times 12.70) - 23.40 = 2.00 \text{ ml.}$ This excess acid was consumed in the neutralization of free alkali present as an impurity (probably as hydroxide crystallized or occluded in the crystal).

Weight of the sample was 4.060 gms.; 1.00 N HCl used as titrant. The material therefore analyzed as follows:

$$\begin{aligned} &\text{TRISODIUM PHOSPHATE:} \\ &(23.40 - 12.70) \times 164.2 \times 100 \\ &\quad \frac{4.060 \times 1000}{= 43.0\% \text{Na}_3\text{PO}_4 \text{ (anhydrous)}} \\ &\text{FREE ALKALINITY:} \\ &\quad \frac{2.00 \times 40 \times 100}{4.060 \times 1000} \\ &\quad = 1.98\% \text{ (as NaOH)} \\ &\text{WATER OF CRYSTALLIZATION:} \\ &\quad 55.02\% \text{H}_2\text{O (by difference)} \\ &\text{MOLECULAR COMPOSITION:} \\ &\text{Na}_3\text{PO}_4 \cdot 0.187 \text{NaOH} \cdot 11.6 \text{H}_2\text{O} \\ &\quad \text{D. K. ALLISON.} \end{aligned}$$

Reeves Developer

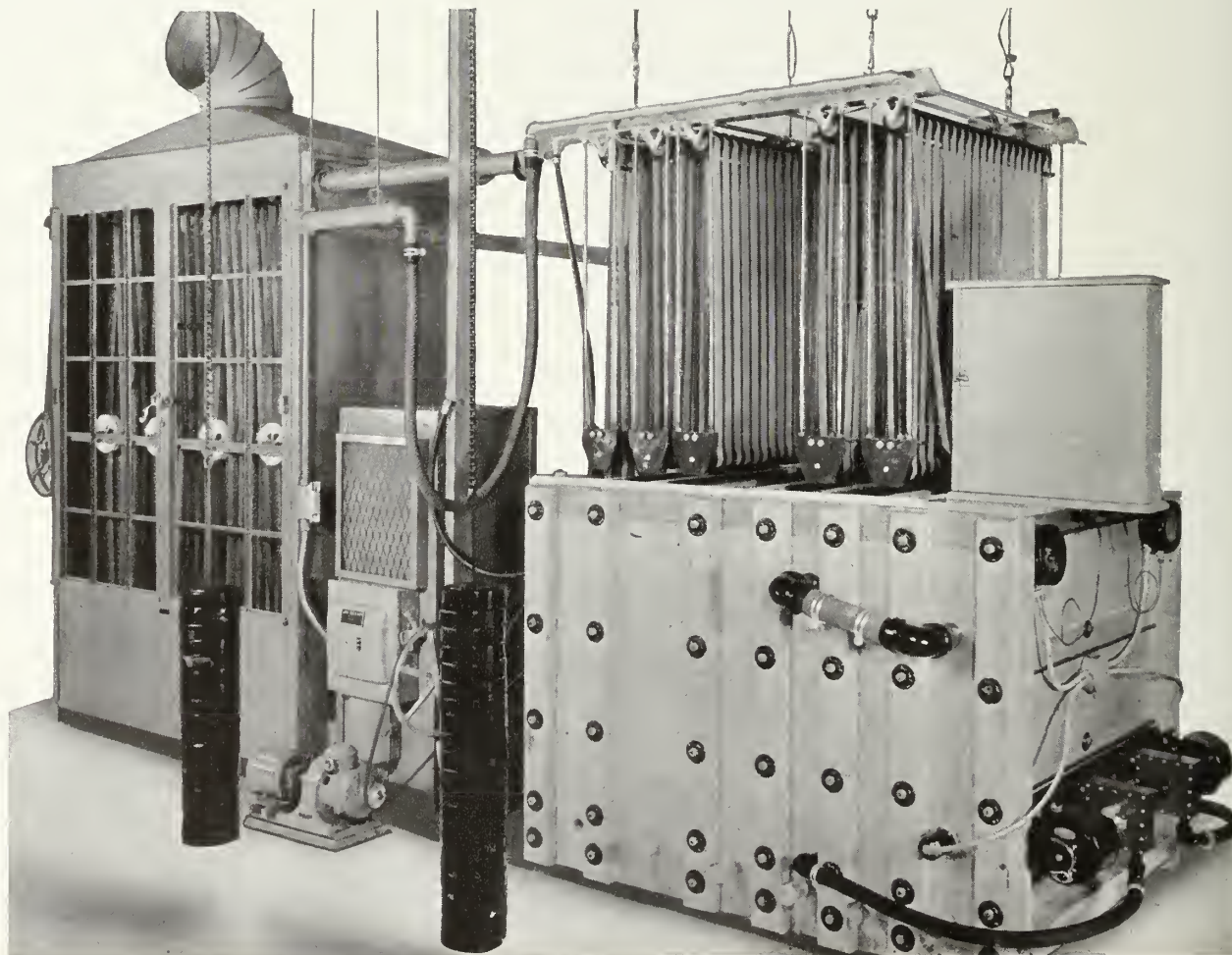
Hollywood organization's automatic machine continues popular through dependable operation.

After several years on the market, the Automatic Developing Machine manufactured by the Art Reeves organization continues to reach consistent sales throughout the world and is one of the most popular items offered by the firm, which recently moved to enlarged headquarters on Santa Monica Boulevard in Hollywood. It has proven a particularly practical installation with those producing organizations and commercial film makers who do not have the best technical facilities readily available and must rely upon handling their own laboratory work entirely.

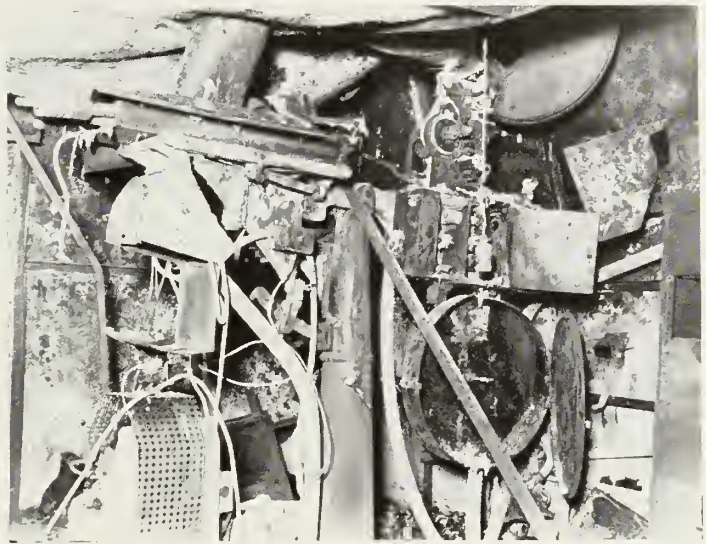
The machine is fully automatic throughout, constructed of tested materials following the best Hollywood practice, and develops either negative or positive film interchangeably. Though a single strand machine, it does not require re-threading or draining or refilling of tanks for the change-over. It will handle either 35 mm. or 16 mm. film.

Construction and engineering have been such that a minimum amount of repairs and replacements is needed and these may be done conveniently. Another feature is its compactness, since in an ordinary installation it occupies two small rooms.

Art Reeves Automatic Developing Machine, which can take either positive or negative in either 35 mm. or 16 mm. and features compactness and ease of operation.



Projection



Paths of Progress Still Wide Open

Studios go to great lengths to study and improve on every angle of projection, but work is wasted unless projectionists in field get managerial support.

As time marches on we pause now and then to pat ourselves on the back. We tell ourselves how good we think we are, that the world is getting better and better and that we had quite a hand in making it that way. But about that time we see some photographs like the above and then we stop for a moment's reflection—after all are we so far ahead of yesteryear?

These pictures are almost self-explanatory. One certain thing is quite prominent and that is the fact that we have not as yet eliminated the danger of fire from the projection room. Yet theatre owners, big and little; theatre managers, circuit supervisors, and on down the line still ignore the plea of the projectionist to repair and replace antique, worn-out equipment. Study the pictures closely. The first thing that attracts you is the fact that the ceiling of the projection room has collapsed from heat, acknowledging the lack of a ceiling ventilation fan. There should be in every booth one of sufficient size to draw flames and gas away from the rest of the projection room, thereby centralizing the fire to one spot, drawing it away from the front wall and the auditorium.

Notice if you will the flexible conduit and the asbestos covered wire is still intact, but what of the drop cord hanging down just over the projector, close to the most vulnerable spot, the open upper magazine while threading.

Also there is a noticeable lack of fire protection on the front wall, worst of all no fire shutters on the port holes.

There is no excuse today for a projection room like this one. Certainly there was a fine marquis and foyer, nice soft rugs on the floor; everything fixed up fine for John Public to see. BUT look at the very heart of the theatre, the projection room. Studios spend millions of dollars on single productions, and as the following article shows, small fortunes are spent on projection rooms in the studios that can be duplicated by any theatre at a nominal cost.

All sorts of projection equipment is tried out under adverse conditions. Everything is done to duplicate conditions as found in various theatres and when successfully duplicated the studios modernize the same projection room, checking costs so that when the picture is on the road and some condition arises to harm the film or mar the production, the studio already has experimented with that condition and knows at once what the causes are and how to rectify them. Various studios have sent out circulars to the projectionists to check, if they can, the reasons for damaged film, etc., and the answer has been the same 90 per cent of the time. The projectionist has frequently turned in requisitions or has asked for necessary new parts or equipment and the message has been "as

long as there is a picture on the screen, NO!"

All theatres and theatre circuits are not like this, but there are still owners and managers that have the economy bug "as long as the picture is on the screen." Then when something goes wrong and the picture is NOT on the screen the great cry goes up: "Fire the projectionist." But if one were to go into detail it would be found that the projectionist has worked on every angle he knows even though the management will not purchase necessary parts to repair and keep up the equipment.

In order to enlighten brother projectionists throughout the United States as to what actually goes on in the projection department of a studio and to what lengths the studios go to assist the theatre projectionist, I have contacted Brother Merle Chamberlin, Chief of Projection at the MGM Studios in Culver City and he in turn introduced me to John Nickalous, head of the MGM laboratory, and they decided that it was not mere words that were needed, but actual photographs of the various operations necessary to put a production on the screen in your theatre.

These fine shots of the projection department at MGM were taken by Eric Carpenter, of MGM's still department, a member of Local 659, IATSE.

Starting with Figure A we find a new Zenith portable set up ready to go, with its Operadio sound system amplifier on a very convenient portable table just ahead of the projectors. This outfit can be completely dismantled in 20 minutes, and packed in two very convenient carriers.

In Figure B we see a close-up of the projector and sound head of the Zenith



Figure A

portable. One of the greatest assets of this projector is its utter simplicity, everything being combined in one head. Note the usual MGM way of lacquering white all projectors, for cleanliness. We are quite sure that any theatre owner or manager would be well repaid by doing the same for his projectionist.

Figure C is a close-up of one type ERPI dummy used. This dummy is threaded with the sound track only, so you can see where it travels: from the full reel up into the sound head and down again to the left hand reel. The reel on the upper right is for the picture film take up. When the dummy is not in use the extra two spindles are removed and a two thousand foot reel is put on the lower left spindle. Note the arrangement of extra idlers installed by Brother Chamberlin to take care of the dummies. Incidentally, this is a Mirrophonic sound head from ERPI.

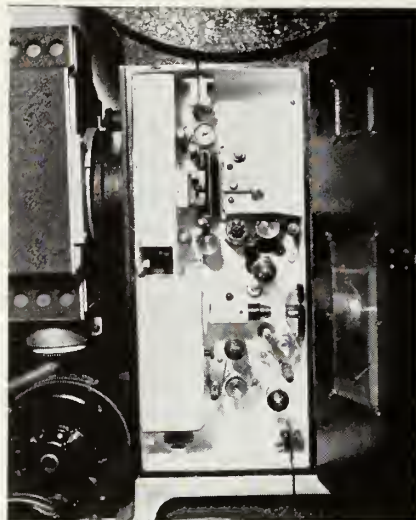


Figure B

Figure D is a close-up of a Super-Simplex projector showing added idlers and the way they are placed. The picture film comes from the upper magazine in the usual way, over upper hold back sprocket then through the projection aperture and over the intermittent sprocket and lower loop in the usual way; then over the lower take up sprocket. Owing to the fact that this sprocket must handle two films, Chamberlin has added an additional idler to the top side (indicated by No. 1) to protect the film from any additional pull created because the film goes to the front instead of down to the magazine. From here the picture film goes to the front and over the idler (indicated by No. 2) and then down into the take up

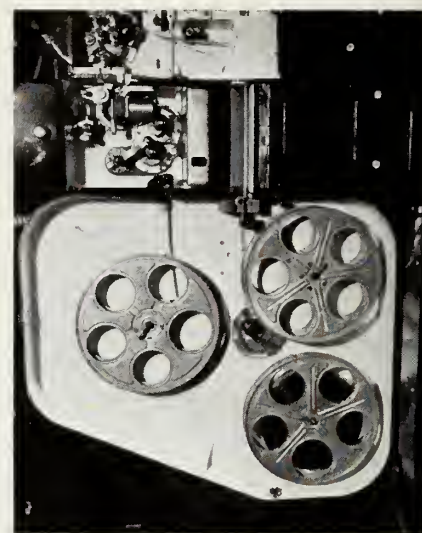


Figure C

magazine. The sound film in turn, comes from lower magazine up to a roller then back to bottom side of the lower take up sprocket (No. 3) and (No. 4) here again Chamberlin has added idlers, one stationary to keep the film from sagging and consequent whipping. From this idler (No. 3), which is stationary, the film goes under the take up sprocket where it is held in place by idlers (No. 4), which are adjustable, then down over the roller into the sound head. It then follows the usual course into the lower take up magazine.

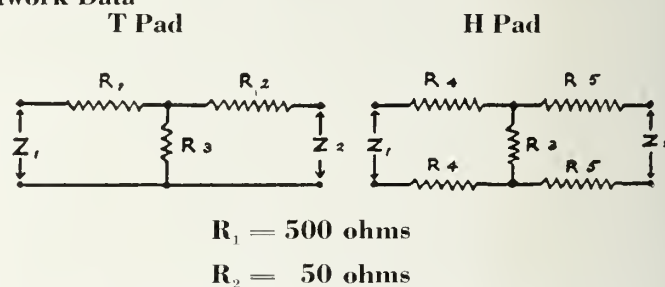
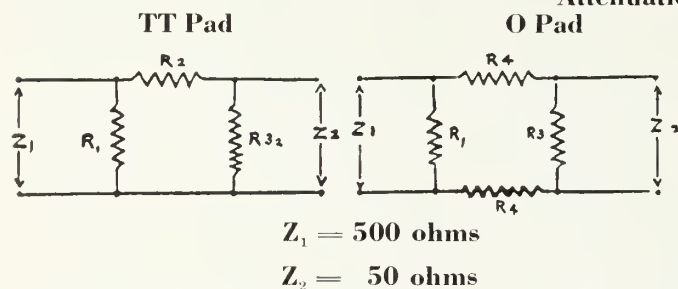
All moving parts in all projectors, as well as the film gate and tension shoes are taken out and replated and machined by Brother Percy Marston, mem-

The SOUNDMAN'S BOOK of TABLES

By J. N. A. Hawkins

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Attenuation Network Data



Loss in D. B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4
15.8	.1622	.....	475	52.6	237.5
16	.1585	930	486	52.5	243
18	.1259	789	617	52.4	308.5
20	.1000	714	782	52.3	391
22	.0794	664	990	52.0	495
24	.0631	620	1,247	51.7	623.5
26	.0501	591	1,573	51.4	786.5
28	.0398	570	1,983	51.1	991.5
30	.0316	554	2,495	50.9	1,247.5
40	.0100	517	7,890	50.3	3,945
50	.0032	505	25,000	50.1	12,500
60	.0010	502	78,000	50.05	39,000

Loss in D. B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4	R_5
15.8	.1622	475	0	52.6	237.5	0
16	.1585	474.0	0.5	51.0	237.0	0.25
18	.1259	475.8	11.4	40.2	237.9	5.7
20	.1000	478.0	19.0	32.0	239.0	9.5
22	.0794	481.0	25.6	25.0	240.5	12.8
24	.0631	484.0	30.4	20.0	242.0	15.2
26	.0501	487.0	34.3	16.0	243.5	17.1
28	.0398	489.5	37.7	12.5	244.7	18.8
30	.0316	491.0	40.1	10.0	245.5	20
40	.0100	496.8	46.8	3.2	248.4	23.4
50	.0032	499.0	49.0	1.0	249.5	24.5
60	.0010	499.7	49.7	0.3	249.8	24.8

Figure D

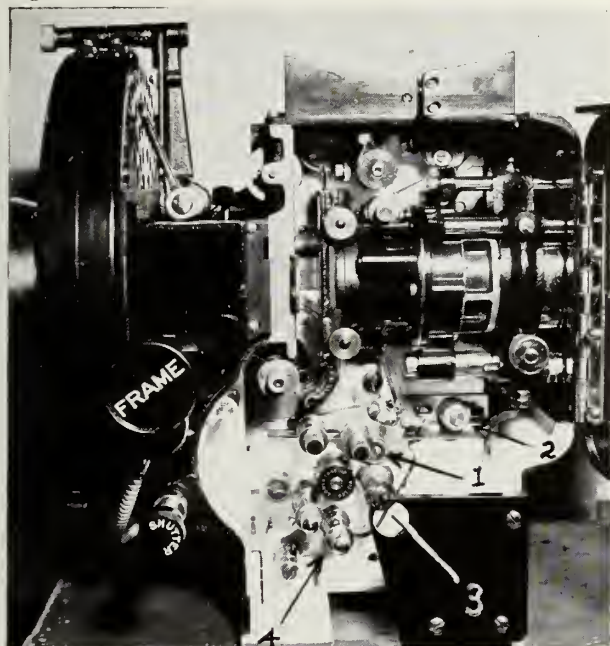


Figure F

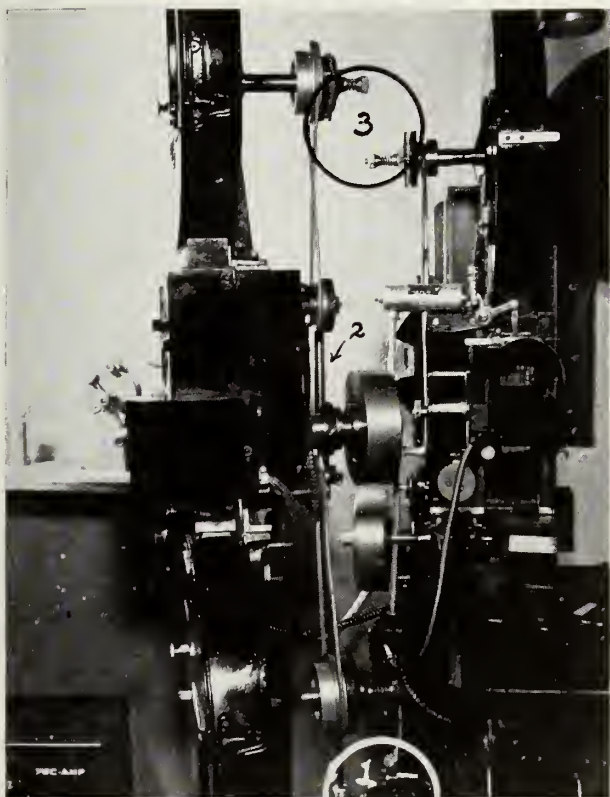
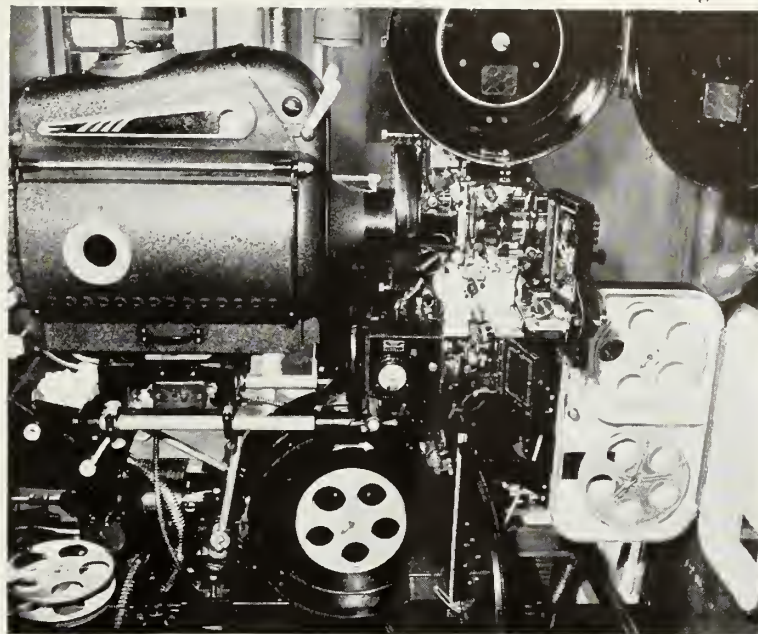


Figure E, (Lower Left)

Figure G

Shaft (No. 2) is direct drive to upper hold-back sprocket. This machine is used in the music and dialogue synchronizing room.

Model E lamp using mirror and Suprex Carbons. Also note the older type ERPI dummy in use in this projection room.

Figure G shows the film lubricator, created at MGM by Mr. Nickolaus, head of the laboratory. This machine is rapidly replacing the old type waxing or processing machine. Note that the emulsion does not at any time touch any part of the machine; all rollers are machined out in the center leaving only a slight edge to touch the part of the film where the sprocket holes are located. In this machine is used a very light and high grade of penetrating oil mixed with a very light wax and this in turn is impregnated in the celluloid. The most important factor considered in the design of these machines was the fact that every foot of film as well as each reel must be lubricated equally. It is virtually impossible to get uneven lubrication from the machines.

There are a number of these machines in operation at one time. They are presided over by Brothers Elwood Borniche, Harry R. Sloane and Wesley Sleeper, all members of Local 683, IATSE.

ber of Machinists Local 1185, before a projector is put in use.

Figure E is of an unusual machine. In order to take this picture it was necessary to remove the lamp house from the projector on the right. This piece of apparatus is a projector and dummy driven from a central shaft from one motor on a universal base. Note on the extreme bottom of the photo at (No. 1) the two gear boxes coming off the one main drive shaft, the one on right for the projector and the one on left for dummy. The salient feature of this equipment is that it will run backward as well as forward at the regular speed of 90 feet per minute. Both upper magazines have one way clutches (No. 3) as well as the two lower magazines.

Reason for the reversing of this equipment is to save rewinding on very short scenes, for instance where the scene is

approximately 200 feet long and the cue happens to be missed. Instead of having to rethread, the projectionist merely reverses the machine and goes back to the starting cue. Brother Chamberlin should be very proud of this piece of equipment for in all of my trips around the studios this is the only one of this type I have seen.

Figure F is a shot of one of the older regular projectors that has been in use for some time. There was not room enough to shoot both projectors so we only took one. The object of this shot is to show you what can be accomplished by having the equipment painted white, the paint seems to close up all cracks that would otherwise hold dirt and oil and bits of film that collect more dirt; and you would be surprised how easy it is to keep equipment like this clean and in repair. This is an Ashcraft

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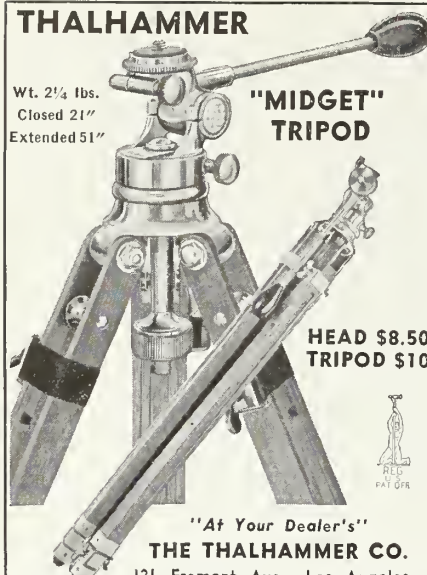
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New Screen Passes Stiff Tests

In last month's issue of INTERNATIONAL PHOTOGRAPHER you were shown a picture of the new sensationally interesting Flat Light Screen. In response to R. M. Hinshaw of the Star and Mayfair Theatres in Weiser, Idaho, we wish to state that Lee De Forest, one of the foremost authorities on sound, has tested the screen thoroughly for sound and given it his whole-hearted and enthusiastic endorsement. Incidentally, Mr. Hinshaw, the match shown on the screen, a small match 1 1/4 inches long, was put there for comparison only and I may add that the holes are much more numerous in the center of the screen than on the outside. This serves two purposes: first, to let the sound through at the mouth of the horns; and second, to darken down the center of the screen where the so-called "hot spot" or more intense light from the projector arc light would appear. This assists materially in giving an even field of light over the screen.

The Flat Light Screen also has passed severe tests by the Electrical Testing Laboratories of New York and by various major studio experts with flying colors. Reports on these tests were received too late for publication in this issue, but detailed data which should interest every projectionist and theatre manager, will be published in the June issue.

PAUL R. CRAMER, Local 150, IATSE.

Academy Report

Details of Research Council's recommendations on standard theatre projection practice.

Last month INTERNATIONAL PHOTOGRAPHER carried a story released by the Academy Research Council just as we were going to press, about the report of the Committee on Standardization of Theatre Sound Projection Equipment Characteristics and we promised to pub-

lish details of the recommendations of the ARC committee in the May issue. The full text of the committee report is published in full herewith, with the exception of the revised Specifications for Standard Electrical Characteristics for Two Way Reproducing Systems in Theatres. This was first released in June, 1937, and was printed in full in the July, 1937, issue of INTERNATIONAL PHOTOGRAPHER.

INTRODUCTION TO THE REPORT.

It has been found that the present two-way speaker systems as currently manufactured, consisting of a true multicellular high-frequency horn and a dynamic low-frequency unit with a substantial air column, give a considerable improvement in reproduced sound quality over that secured in the past. However, certain differences exist between the present systems which make it difficult for the recording studios to accurately determine the average characteristics of theatre reproducing systems. While these differences may not seem to the casual observer to be of great magnitude, it is felt that the existing differences in studio product cannot be materially reduced until such time as the loud-speakers appear more acoustically alike to the trained observer.

The information below has been compiled in an effort to help to produce this result. This report, containing the following general specifications, has been divided for convenience into six parts:

- Part 1—The Sound Head and Associated Equipment.
- Part 2—Volume Control Equipment.
- Part 3—Amplifiers and Filters.
- Part 4—Loud-Speakers and Dividing Networks.
- Part 5—Servicing Requirements.
- Part 6—Studio and Preview Theatre Requirements.

PART I

THE SOUND HEAD AND ASSOCIATED EQUIPMENT.

Noise Level: Sound head should be so designed that noise level due to vibration of gear and drive equipment will be sufficiently low that overall system, of which this sound head is a part, will meet the—35 db./0.006 watts hum level as described in later specification. Combining photocell and optical system on single vibration-proof mounting plate, mounting drive motors in a shock-proof assembly, use of adequate shielding of photocell transformer and other electrical equipment in sound head and use of static shield to reduce static pickup by film and drum are examples of good design practice to minimize hum and electrical noises in sound head. Sprocket hole noise caused by scattered light which results in 96 cycle modulation has been minimized either by use of mask to block

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out scanning beam between sound track and sprocket holes or by designing optical system which reduces light leakage.

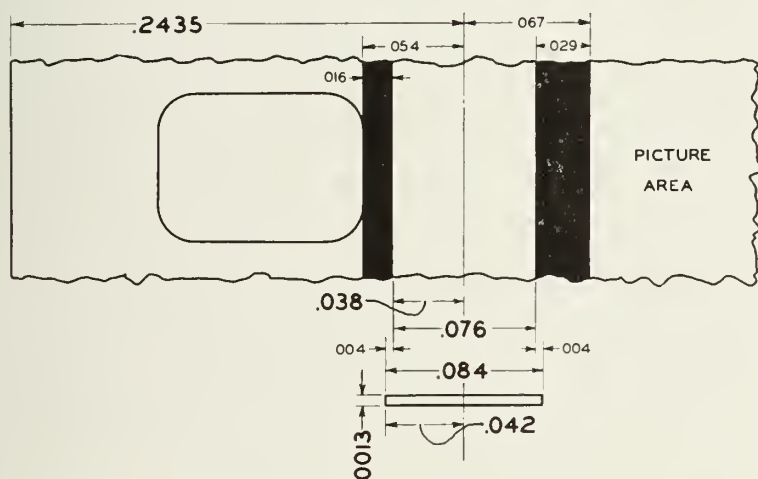
Uniformity of Output Volume: Illumination in a lateral direction across scanning slit shall be such that maximum variation in output of photocell will be less than $\pm 1\frac{1}{2}$ db. when measured with track consisting of non-overlapping increments, each of not more than 7 mils width. Regulation equipment shall be available so that when power line voltage changes ten per cent overall gain of system, including ex-

citer lamp, photocell, amplifiers, and horn fields, shall not vary more than 2 db. as measured in terms of acoustical output from speakers.

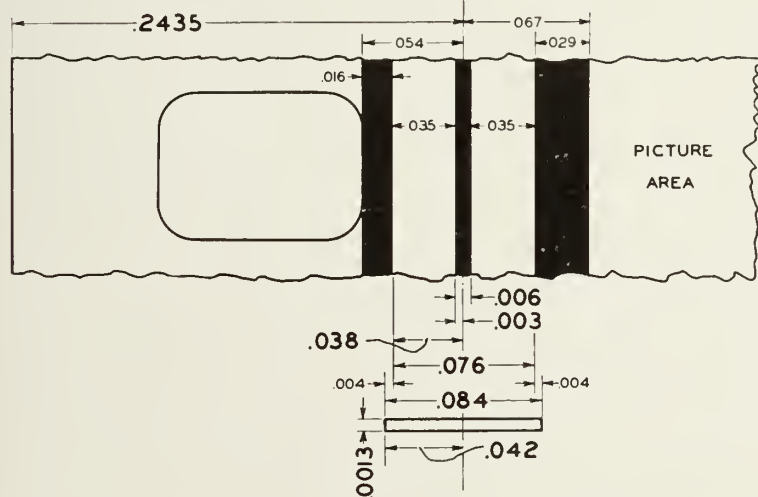
Weave: Weave in the sound head shall not be greater than ± 2 mils. The Committee has often observed sprocket hole and other noises due to weave in reproduction from both variable area and variable density recordings and a clipping of peaks in case of variable area.

Film Damage: Design of head shall be such as to avoid all possibility of damage to film, in both picture and

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sound track areas. At no point in travel of film through picture and sound heads should sound track area, either emulsion or celluloid side, come into contact with any part of equipment. All idler rollers should turn freely and shoulders on both sides of all rollers and sprockets should be relieved. Rollers and sprockets of projection head and rollers of fire trap should also be relieved in sound track area. Consideration should be given to possibility of guiding film through fire trap to avoid scratching film.

Oil Leakage: In design of sound head, consideration should be given to location of electrical and optical equipment to minimize difficulties due to oil leakage from sound and picture heads. Use of oil-proof wiring throughout sound head has been found to be very desirable.

Push-Pull Cancellation: Design shall include provision for easy method of obtaining maximum push-pull cancellation. Balance should be extended as far as possible over entire frequency range from 50 to 8,000 cycles, with minimum cancellation of 25 db. below 1,000 c.p.s.

Track Location: Track location and scanning width shall be set according to attached Academy Research Council Drawing, "Proposed Standard Sound Track Dimensions and Position." (See Page 00.) It will be noted that all matting will be done in negative and that no septum is required in sound head for reproduction of push-pull recording.

Starting Speed: Flywheels or an equivalent device shall be used to limit starting acceleration.

Flutter: Total flutter shall be less than 0.15 of 1%, as measured with ERPI Flutter Measuring Instrument, or less than 0.30 of 1% as measured with the RCA Flutter Measuring Instrument. (Standardization of flutter measurement procedure is now under consideration by Research Council, upon which a supplementary report will be issued in near future.)

PART II

VOLUME CONTROL EQUIPMENT.

Volume Control Range: Adjustable gain control of at least 50 db in 2 db steps shall be provided, of which at least 16 db is available at changeover position on wall. Wall attenuator is required at changeover position, because of great difference in level between newsreels and "Hi-Range" prints. Additional volume control shall be a detent operated device incorporated in main amplifier to be used to compensate for any abnormal conditions which may arise.

Machine Balance: Balancing facilities shall be provided to allow output of each machine to be balanced to within 1 db.

PART III

AMPLIFIERS AND FILTERS.

Gain: Overall gain of system shall be sufficient to provide 20 db in excess of normal requirement.

Frequency Response: Complete electrical system shall be capable of frequency response varying not more than ± 1 db in range from 40 to 10,000 c.p.s.

Distortion: At its rated output amplifier shall not generate more than 2% total harmonic in frequency range from 50 to 5,000 c.p.s. Amplifier output is average power into specified resistance

load when amplifier is excited with sinusoidal input signal. Harmonic content is defined in terms of a ratio of currents between root mean square sum of all harmonic components and fundamental.

The Low-Pass Filter: Low-pass filter shall be designed to obtain Standard Electrical Characteristic as specified by Research Council. (Revised Standard Electrical Characteristics for Two Way Reproducing Systems, described in the Bulletin of June 8, 1937.) (Int. Photog. July, 1937.)

It is anticipated that changes in electrical characteristic will be necessary from time to time, and for this reason low-pass filter shall be adjustable over wide range. Low-pass filter shall be inserted in position in the circuit such that it is not subject to extraneous pickup and will be capable of filtering out hiss and high-frequency disturbances generated in early stages of the amplifier.

Hum Level: Under operating conditions residual hum due to frequencies below approximately 300 c.p.s. shall not be greater than—35 db/0.006 watts and high-frequency noises shall be sufficiently below this value so that machine, running without film, will have an output noise which is principally hum and is no greater than 35—db. This specification has been so set up that no hum will be audible in front row seats in theatre auditorium under normal operating conditions.

PART IV

LOUD-SPEAKERS AND DIVIDING NETWORKS.

Acoustic Response: As measured with flat overall electrical characteristic, trend of acoustic response of loud-speaker system when measured by conventional warble frequency method shall not vary by more than ± 3 db from the following characteristics: namely, flat over frequency range from 50 to 2,000 cycles; not decreasing more than 5 db per octave in range from 2,000 to 10,000 cycles; and not decreasing more than 10 db from 50 to 30 cycles.

The loud-speaker system shall be designed to adequately carry rated output of amplifier system.

Conventional method of measurement referred to involves the averaging of five (5) or more readings made with microphone close to speakers. In making measurements, care must be taken to select microphone positions which will not favor response of either high- or low-frequency units. Most suitable conditions under which such measurements can be made are either in large acoustically dead room or out of doors. In either case intensity of extraneous noises must be sufficiently low not to affect measurements.

Electro-Acoustical Efficiency: A magnetic structure shall be provided which is as efficient and distortionless as present deluxe two-way horn systems, to avoid necessity of increasing power-handling capacity of amplifiers.

Angular Distribution: In certain installations it is necessary to have wide horizontal coverage, and high-frequency horn shall be available which will cover a maximum horizontal angle of 105 degrees. Horns shall also be available to cover vertical angle of 65 degrees.

Rear Radiation: Past practice indicates extreme need for reducing rear radiation from loud-speakers, and it is

desirable that loud-speakers be manufactured which have minimum of rear radiation.

Dividing Networks: Dividing networks shall be designed to have an attenuation of approximately 12 db per octave.

PART V SERVICING REQUIREMENTS.

Meters and Circuit Arrangements: Accessible terminals for volume indicator and switch for substitution of resistance equivalent to loud-speaker load should be provided at output of power amplifier in order that electrical characteristic may be conveniently measured. It is further recommended that meter or its equivalent be made available on various vacuum tubes, as it is difficult to service equipment which does not have adequate metering facilities.

Wear: Design of the sound head should be such that items subject to wear are easily removable; for instance, provision should be made for the easy replacement of felt pads on pad roller.

Maintenance: All equipment and wiring should be available for inspection

and maintenance. For instance, an accessible method for checking photocell transformer and wiring without disturbing the rotary stabilizer, if used, should be provided.

Measurement: Any part of equipment which is subject to measurement should be designed so that such measurement may be conveniently made.

Physical Position of Equipment: From servicing standpoint, it is desirable to mount as much of projection equipment as practicable in booth, such as field supply and dividing networks for loud-speakers.

PART VI STUDIO AND PREVIEW THEATRE REQUIREMENTS.

In reproducing equipment used in preview theatres and in the studios, certain requirements are necessary in addition to those of average theatre. These additional requirements are listed below and are given here in order that manufacturer, when designing and planning new equipment, may make provision for them. It is essential that studio sound departments review their product in rooms having equipment

which is typical of that in theatres, in order that they may evaluate product in terms of average theatre equipment.

Double Film Attachments: Sound heads should be designed so that it is not difficult to provide either single-phase or interlocked motors and space should be provided for the mounting of double film attachments capable of handling 1000 foot reels.

Auditorium Volume Control in Link Circuits: A link circuit of 500 ohms impedance should be provided in the voltage amplifier for auditorium volume control. This facility should be available without raising hum level and for this reason it is recommended that volume control be at position approximately 40 db above photocell level. It is further specified that power capacity of amplifier system must not be reduced when maximum of 20 db attenuation is used in auditorium control. In order to avoid possibilities of introducing distortion when inserting equipment in link circuits, it is very desirable to have constant impedance in both directions throughout frequency range used.

The PROJECTIONIST'S BOOK of TABLES

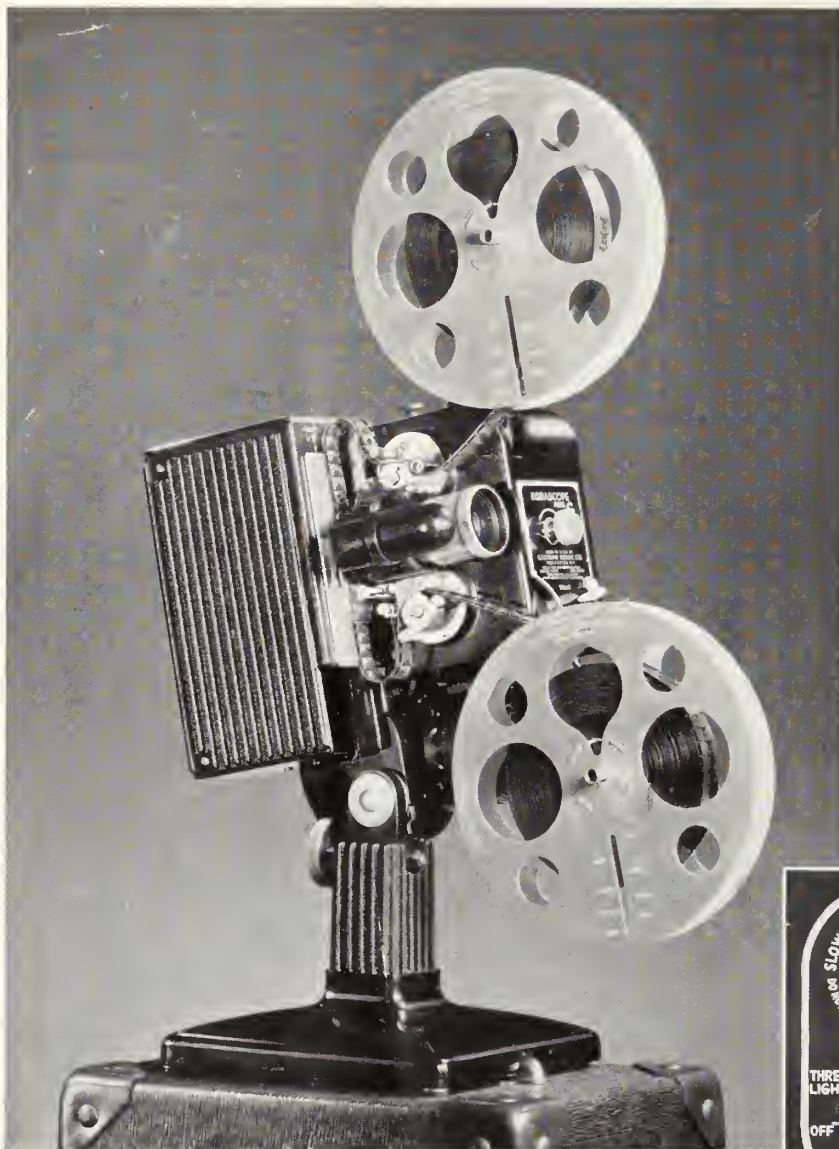
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-9	0.1259	0.0007553	0.35481	.6732	0.6145	.4351	.2747	.1941	.1503	.1095	.07745	.0547
-8	0.1585	0.0009509	0.39811	.7554	0.6895	.4887	.3083	.2179	.1688	.1232	.0871	.0616
-7	0.1995	0.0011972	0.44668	.8475	0.7737	.5461	.3464	.2445	.1894	.1382	.0974	.0691
-6	0.2512	0.0015071	0.50119	.9509	0.8681	.6124	.3872	.2744	.2126	.1552	.1095	.0774
-5	0.3162	0.0018975	0.56234	1.0670	0.9740	.6856	.4357	.3079	.2385	.1741	.1232	.0871
-4	0.3981	0.0023886	0.63096	1.1972	1.0928	.7681	.4898	.3464	.2675	.1954	.1382	.0974
-3	0.5012	0.0030071	0.70795	1.3433	1.2262	.8661	.5477	.3872	.3003	.2193	.1549	.1095
-2	0.6310	0.0037857	0.79433	1.5071	1.3758	.9746	.6164	.4358	.3316	.2459	.1737	.1228
-1	0.7943	0.0047660	0.89125	1.6910	1.5437	1.090	.6855	.4898	.3741	.2760	.1951	.1378
0	1.0000	0.0060000	1.00000	1.8974	1.7321	1.224	.7745	.5477	.4242	.3098	.2190	.1549
+1	1.2589	0.0075535	1.1220	2.1289	1.9434	1.371	.8660	.6082	.4795	.3464	.2457	.1737
+2	1.5849	0.0095093	1.2589	2.3886	2.1805	1.539	.9746	.6855	.5292	.3872	.2756	.1949
+3	1.9953	0.0119716	1.4125	2.6801	2.4466	1.732	1.095	.7745	.6000	.4358	.3093	.2186
+4	2.5119	0.0150713	1.5849	3.0071	2.7451	1.939	1.224	.8660	.6708	.4898	.3464	.2453
+5	3.1623	0.0189747	1.7783	3.3741	3.0801	2.177	1.374	.9746	.7549	.5477	.3872	.2754
+6	3.9811	0.0238865	1.9953	3.7867	3.4559	2.443	1.545	1.091	.8246	.6164	.4358	.3093
+7	5.0119	0.030071	2.2387	4.2477	3.8776	2.740	1.732	1.224	.9486	.6928	.4898	.3464
+8	6.3096	0.037857	2.5119	4.7660	4.3507	3.075	1.944	1.374	1.063	.7745	.5477	.3872
+9	7.9433	0.047660	2.8184	5.3475	4.8816	3.464	2.181	1.542	1.191	.7817	.5477	.3872
+10	10.0000	0.0600000	3.1623	6.0000	5.4772	3.872	2.449	1.732	1.341	.9797	.6928	.4898
+11	12.589	0.075535	3.5481	6.7321	6.1455	4.347	2.747	1.944	1.503	1.095	.7745	.5477
+12	15.849	0.095093	3.9811	7.5536	6.8954	4.898	3.082	2.181	1.688	1.232	.8717	.6144
+13	19.953	0.119716	4.4668	8.4752	7.7368	5.477	3.464	2.449	1.894	1.382	.9797	.6928
+14	25.119	0.150713	5.0119	9.5094	8.6808	6.152	3.872	2.747	2.126	1.552	1.095	.7745
+15	31.623	0.189747	5.6234	10.670	9.7400	6.856	4.358	3.082	2.385	1.740	1.232	.8717
+16	39.811	0.238865	6.3096	11.972	10.9285	7.745	4.898	3.464	2.675	1.954	1.382	.9797
+17	50.119	0.30071	7.0795	13.433	12.2620	8.660	5.477	3.872	3.003	2.190	1.551	1.095
+18	63.096	0.37857	7.9433	15.071	13.7582	9.695	6.164	4.358	3.317	2.459	1.740	1.232
+19	79.433	0.47660	8.9125	16.910	15.4369	10.90	6.861	4.898	3.741	2.760	1.954	1.382
+20	100.000	0.600000	10.0000	18.974	17.3205	12.24	7.745	5.477	4.242	3.098	2.190	1.549
+21	125.89	0.75535	11.220	21.289	19.434	13.711	8.660	6.164	4.795	3.464	2.457	1.737
+22	158.49	0.95093	12.589	23.886	21.805	15.41	9.746	6.861	5.291	3.872	2.756	1.949
+23	199.53	1.19716	14.125	26.801	24.466	17.29	10.954	7.745	6.000	4.358	3.093	2.186
+24	251.19	1.50713	15.849	30.071	27.451	19.39	12.24	8.660	6.708	4.898	3.464	2.449
+25	316.23	1.89747	17.783	33.741	30.801	21.77	13.78	9.746	7.549	5.477	3.872	2.756
+26	398.11	2.38865	19.953	37.867	34.559	24.43	15.45	10.95	8.432	6.164	4.358	3.093
+27	501.19	3.0071	22.387	42.477	38.776	27.40	17.32	12.24	9.486	6.928	4.898	3.464
+28	630.96	3.7857	25.119	47.660	43.507	30.75	19.44	13.78	10.63	7.745	5.477	3.872
+29	794.33	4.7660	28.184	53.475	48.816	34.64	21.81	15.45	11.91	8.717	6.164	4.358
+30	1000.00	6.0000	31.623	60.000	54.772	38.72	24.49	17.32	13.41	9.797	6.928	4.898
+31	1258.9	7.5535	35.481	67.321	61.455	43.58	27.47	19.44	15.03	10.95	7.745	5.477
+32	1584.9	9.5093	39.811	75.536	68.954	48.98	30.82	21.81	16.88	12.32	8.717	6.164
+33	1995.3	11.9716	44.668	84.752	77.368	54.77	34.64	24.49	18.94	13.82	9.797	6.928
+34	2511.9	15.0713	50.119	95.094	86.808	61.64	38.72	27.47	21.26	15.52	10.95	7.745
+35	3162.3	18.9747	56.234	106.70	97.400	69.28	43.58	30.82	23.85	17.37	12.32	8.717
+36	3981.1	23.8865	63.096	119.72	109.285	77.45	48.98	34.64	26.75	19.54	13.82	9.797
+37	5011.9	30.071	70.795	134.33	122.620	86.60	54.77	38.72	30.03	21.93	15.52	10.95
+38	6309.6	37.857	79.433	150.71	137.582	97.45	61.64	43.58	33.16	24.59	17.37	12.32
+39	7943.3	47.660	89.125	169.10	154.369	109.08	69.28	48.98	37.41	27.60	19.54	13.82
+40	10000.0	60.000	100.000	189.74	173.205	122.47	77.45	54.77	42.42	30.98	21.93	15.52
+41	12589.2	75.535	112.20	212.89	194.34	137.47	86.60	61.64	46.92	34.64	24.59	17.37
+42	15848.9	95.093	125.89	238.86	218.05	153.94	97.46	69.28	52.91	38.72	27.60	19.54
+43	19952.6	119.716	141.25	268.01	244.66	173.20	109.54	77.45	60.00	43.58	30.98	21.93
+44	25118.9	150.713	158.49	300.71	274.51	193.91	122.42	86.60	67.08	48.98	34.64	24.59
+45	31622.8	189.747	177.83	337.41	308.01	217.71	137.83	97.46	75.49	54.77	38.72	27.60
+46	39810.7	238.865	199.53	378.67	345.59	244.33	154.51	109.54	84.32	61.64	43.58	30.98
+47	50118.7	300.71	223.87	424.77	387.76	274.04	173.21	122.42	94.86	69.28	48.98	34.64
+48	63095.7	378.57	251.19	476.60	435.07	307.57	194.42	137.83	106.32	77.45	54.77	38.72
+49	79432.7	476.60	281.84	534.75	488.16	346.41	218.17	154.51	119.17	87.17	61.64	43.58
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June, 1938

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International

PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

Hollywood, California

No. 5

Vol. 10



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Did you know that hundreds of newspapers have adopted large type since surveys have shown that 39% of all people thirty years old, and 48% of all people of age forty, and 71% of those at fifty, have defective eyesight?

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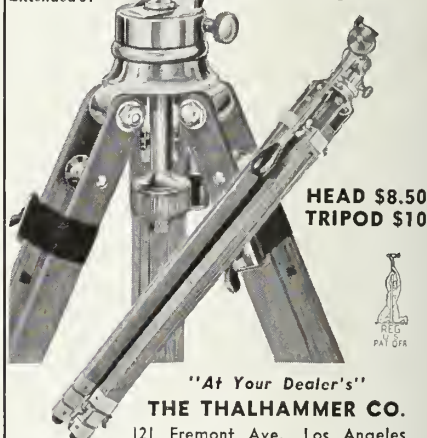
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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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Vol. X.

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No. 5

ON THE COVER. Bob Coburn, member of Local 659, IATSE, turned out this beautiful close-up on Henry Fonda and Madeleine Carroll, who are starred in Walter Wanger's "Blockade," a romantic story interwoven with the background of the current Spanish war, that has provoked much speculation since its preview was held up last month, reportedly over controversial elements in the story.

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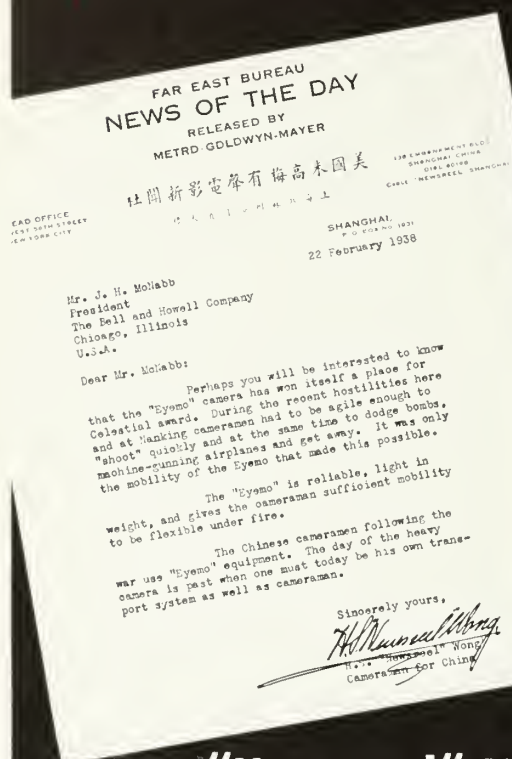
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As Wong states in his letter, the versatile Eyemo surmounts even the difficulties met in filming the battlefield. Because of its ease of handling, the cameraman is able to follow the swift shifting points of action. The Eyemo is instantly convertible to meet any emergency. A quick change of lenses? . . . conversion from 100-foot film capacity to 200- or 400-foot magazines? . . . a tripod mount or a light easy-to-handle hand camera? . . . a change from electric to spring or hand drive? . . . a silent camera or a hookup for sound? . . . slow motion or silent or sound speeds? Whatever the need, there is an Eyemo model or accessory to meet it.

Built with typical Bell & Howell precision, the new Eyemo is more than sufficiently sturdy to withstand the strenuous work that characterizes newsreel production. Such features as three-lens turret, focusing and diaphragm controls visible through the spyglass viewfinder, and accurate speeds make the new Eyemo more flexible than ever before.

Send this coupon now and get complete information describing the Eyemo in detail. No obligation whatsoever. Bell & Howell Company, 1848 Larchmont Avenue, Chicago, Illinois. New York: 11 West 42nd Street; Hollywood: 716 North LaBrea Avenue; London: 13-14 Great Castle Street. *Established 1907.*

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A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

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TWO NEW HANDBOOKS SET

Make-up Artists Handbook by Murdock and Studio Mechanic's Handbook by Haines to be added to *International Photographer's* regular data services.

INTERNATIONAL PHOTOGRAPHER will inaugurate two new services in its popular tables series with the July issue, adding handbooks on make-up and studio backlot equipment to our current series of books of tables on cinematography, sound, laboratory and projection.

The Make-up Artists' Handbook will be edited by Vern Murdock, business representative of the studio make-up artists Local 706, IATSE, with outstanding experts among the make-up artists contributing authoritative sections on various specialties.

The Studio Mechanic's Handbook will be edited by George Haines, member of Local 37, IATSE, in association with Lew C. G. Blix, secretary of Local 37, and an advisory committee of veteran studio workers amongst Local 37's membership. This, the numerically largest West Coast studio local of the IATSE, includes the grips, gaffers, props, special effects, miniature, nursery, studio projectionists, drapers and other "back lot" crafts.

Both the handbooks will appear in format similar to the current tables familiar to readers of INTERNATIONAL PHOTOGRAPHER. They will be the first complete and authoritative compilations by working Hollywood professional experts of the data in their respective fields.

The major studios and still photographers of Local 659, IATSE, have promised full cooperation in providing complete illustrations for the new handbooks

and leading manufacturers also will assist in providing information and equipment needed.

The handbooks will eventually be published in book form. The make-up handbook will cover all phases of professional make-up for photography and the "back lot" handbook will for the first time present a codification and description of all the many items that go into motion picture production from "gobos," "flats" and "flags" to "rifles" and "babies."

Due to the pressure of business on their authors, the regular installments of the Cinematographers Book of Tables by Fred Westerberg, the Laboratory Book of Tables by D. K. Allison, and the Projectionist's Book of Tables by William Comyns, are missing from this current

issue, but they will resume these valuable features in the July INTERNATIONAL PHOTOGRAPHER.

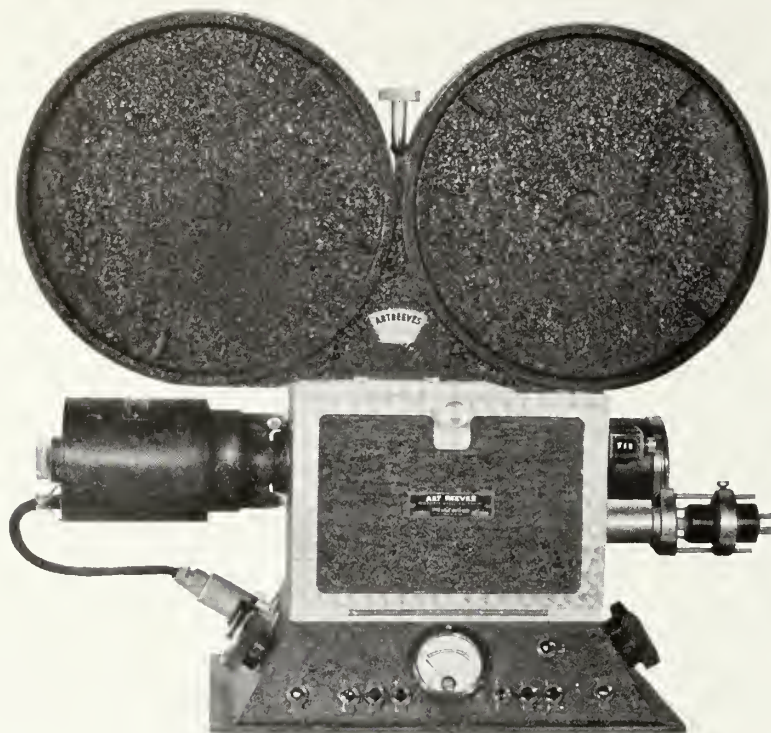
Photrix Meter

The new Photrix electric exposure meter is a compact instrument that can be worn fastened to the wrist like a watch. The dial faces at right angles to the light intake, and can be read conveniently from the top when in the wrist-watch position. The Photrix is similar to other electric exposure meters in operation, except that it does away with setting levers or dials. It has no computer dial, this function being taken care of by an arrangement of the scales. Outer surface is of smooth Bakelite and glass with no protruding parts. It is 2 1/2 by 2 inches in front dimensions, slightly larger than the familiar paper match packet, and is 13/16 of an inch thick. The Photrix sells with eveready case for \$16 and a deluxe model in white Bakelite with pigskin zipper case costs \$20. The wrist strap costs \$1.00.

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Greetings To "I. A." Delegates

INTERNATIONAL PHOTOGRAPHER and the members of the West Coast Studio Locals of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada extend greetings and fraternal good wishes to the delegates to the IATSE Convention, which opens in Cleveland, Ohio, June 5th. It is our sincere hope that under International President George E. Browne's able administration, that this publication can continue to improve and expand its service as a medium between the production and distribution and exhibition branches of the industry in the dissemination of constructive news of technical activities.



1938 Model Art Reeves Variable Density Recorder

ing Corp., 8 West 40th Street, New York City.

Victor Price Cut

Victor Animatograph Corporation, of Davenport, Iowa, manufacturers of the well known 16mm Animatophone Sound Projector, has effected material list price reductions on its Models 25AC, 24B and 38. Effective immediately the revisions are:

Model 25AC, 10-Watt Undistorted Output, with 10-inch Speaker, was \$455.00—now \$415.00.

Same with G-12 High Fidelity Speaker was \$490.00—now \$450.00.

Model 24B, 15-Watt Undistorted Output, was \$595.00—now \$520.00.

Model 38, 30-Watt Undistorted Output, with two 12-inch P. M. Speakers, was \$660.00—now \$595.00.

The new Model 33 "All-in-One" Animatophone lists at \$295.00 complete.

Company executives state that, although material and labor costs have steadily increased, price reductions have been made possible by a constantly growing volume of sound projector business, a large part of which has come from the school market.

Graflex Publications

Incorporating twenty outstanding photographs, many of them prize-winners in major contests and exhibitions, as well as photographs of twenty-four of the country's most illustrious photographers, the new Graflex catalog now is being distributed and it can be obtained without charge either by writing direct to the Folmer Graflex Corporation or at Graflex dealers.

Also, a revised and up-to-the-minute edition of Franklin I. Jordan's well-known book, "Photographic Enlarging," published by the same company, is now off the presses and obtainable from representative photographic dealers. The

new edition has the same high quality of workmanship, paper stock and binding that featured the initial volume, which sold at \$3.50.

NVE Session

The National Conference on Visual Education has completed the program for its eighth summer session, to be held at Francis W. Parker School in Chicago, July 20-23. This organization operates with no admission or membership fees and advance information is that an especially interesting program has been laid out for those interested in commercial and educational films, particularly in the sub-standard field.

The program will open with an address of Homer Buckley, a well-known advertising executive; with a reply by Mr. H. A. DeVry, president of the DeVry Corporation, and founder of the National Conference, which is now in its eighth year.

Other speakers and their subjects:

Fred B. Semb, "German Railroads"; J. J. Ferguson, of Fireman's Fund Insurance Co., showing "Remember Jimmy"; G. R. Browder, General Motors Corp., showing the Oldsmobile film, "Stranger Than Fiction"; "A School in CCC Barracks" will be presented, also in film and discussion form by George Rilling, Superintendent of Schools, Anna, Ohio; F. L. Warren, of the L. C. Chase & Company, of Chicago, "Story of Mohair."

Dr. I. E. Deer, representative of the Motion Picture Producers' Association, will talk upon Hollywood's efforts to improve upon motion pictures and make them more suitable for educational use; and L. A. Hawkins, of International Harvester Company, will present their "Back

to the Farm" film.

Educators on the program include: A. P. Heflin, of Lane Technical High School; Stuart Grant, of Pure Oil Company; R. E. Hughes, of the Evanston Township High School; Dr. Francis S. Onderdonk, of Ann Arbor, Michigan; Dr. James Bliss, of Western Reserve University, Cleveland, Ohio; and William E. Morse, County Superintendent of Schools, Malad, Idaho.

There are many other well-known speakers who will appear on the program and who will tell the conference guests interesting and valuable stories of motion pictures as the subject applies to education and to industry.

Since the school has become an important point of distribution of industrial films, the relationship between industry and education, together with the obligations entailed, will be discussed in its many phases.

Other subjects of discussion will be: "Bird Films," presented by William L. Zeller, of Peoria, Illinois; "Visual Aids in Religious Education," by Paul Vieth, of Yale University; "Brain Anatomy," "School Film Production," "America's Home Songs in Picture and Story," presented by Irving Garwood, of Western Illinois State Teachers College; "Getting the Professional Touch in School and Industrial Motion Pictures," presented by Jack Gallagher, of Hollywood.

The splendid documentary film, "The River," will be shown by A. A. Mercy, U. S. Department of Agriculture, of Washington, D. C., who will give an interesting inside story of this picture and the important innovations it represents in the field of education.

B & H Sales Chief

J. Harold Booth has been appointed general sales manager of the Bell & Howell Company, replacing J. G. Llewellyn, who is no longer affiliated with this company. For the past three years, Booth has been assistant sales manager of the company. Prior to this, he was a development engineer in the research laboratories of the same organization, specializing in the design of amplifiers and sound projectors. He has been with the firm for 11 years. Before joining Bell & Howell, Booth was advertising manager of the W. L. Clark Company of New York.

1938 Reeves Recorder

A new 1938 model of the Art Reeves Ultra Fidelity Variable Density Recorder, now is available. The new model features all advantages familiar to the Reeves ultra-violet recording for variable density, but also has been redesigned and improved for greater strength and efficiency, and, as illustrated herewith, its outer appearance features streamlined simplicity.

The recording head is of the portable type. While suitable for fixed installa-

tion, either in a studio recording room or in a mobile recording truck, the recorder is as portable as a camera.

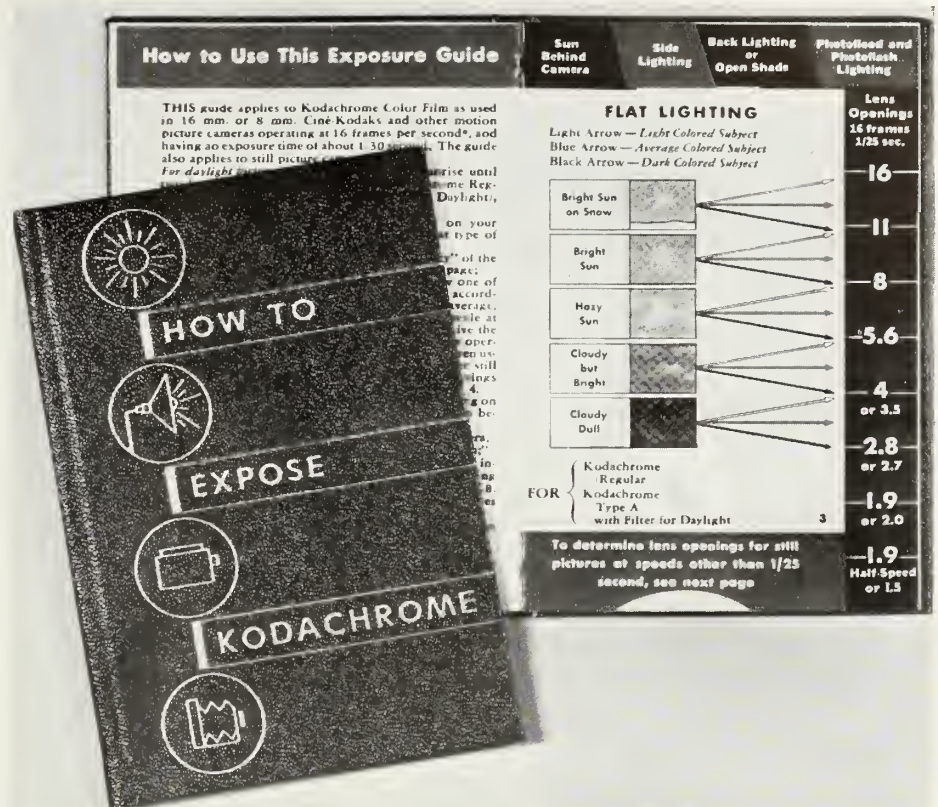
Adaptability of the 1938 model recorder is heightened by provision for complete interchangeability of driving motors, permitting normal operation from almost any desired power supply including batteries, DC or AC generators, or from alternating current mains of almost any frequency. To allow this, the driving motor is a separable unit, attaching to a standard camera-type motor mount and it is therefore possible to drive this recorder with any standard camera motor suited to the available power supply. Normally battery-powered DC interlock motors for camera and recorder are supplied with each equipment.

The automatic speed control has been retained in the 1938 design. It has, however, been made an integral part of the recorder rather than of the motor. If it is desired for any reason to control speed manually, a special switch in the base of the machine throws the automatic control out of the circuit. A standard footage counter and tachometer are regularly supplied. Both of these are carefully calibrated to be accurate with the recorder upon which they are used. These accessories are built into recording head and are easily visible to the recordist.

The new model offers a modern and simple design. Only two sprockets, a dampened, free-running recording drum, and four sets of guiding idling rollers are used. This simplicity has not been achieved by any sacrifice of uniformity of the film's motion past the recording aperture. The large main sprocket carries the primary loads of feeding the film from and to the magazine; the secondary sprocket insures uniform film-feed from the recording drum. Both these sprockets run on precision-built ball bearings. The recording drum is also supported on precision ball bearings, and has an efficient damper of a special type which is absolutely unaffected by any temperature changes. The mass of this damper is sufficient to assure unfailingly uniform movement of the recording drum. The surface of this drum is ground to such a high polish that, in a manner not unlike the celebrated Johansson adhesion gauges, the film adheres to this polished polished surface and partakes of the uniform motion of the drum.

Gear-trains driving the sprockets are lubricated by a single "one-shot" oiler. The ball bearings require no lubrication, as they are of a special design, lifetime-lubricated at the factory.

The recording unit for which this equipment was designed, and which is regularly supplied therewith, is the new Art Reeves "Ultra Fidelity" variable-density glow-lamp opticon system, fitted with the Art Reeves "Line-O-Lite" ultra-violet glow-lamp. This unit projects a slit-shaped recording beam on the film. No part of the "Ultra Fidelity" optical unit is at any time in direct contact with the surface of the film, clearing it by more than one-sixteenth of an inch. No physical slit or other recording aperture is necessary, for the light-source in the "Line-O-Lite" glow-lamp is in itself a narrow line of light only a few thousandths of an inch in width. This is focused upon the film by a special optical system and results in a fine line



of intensely actinic light approximately 0.0005 inch in width.

For those who may prefer to record by the variable-area method, a high quality galvanometer recording unit of Reeves manufacture may be fitted to these recorders, at a slight additional cost.

Manufacturer: Art Reeves, 7512 Santa Monica Blvd., Hollywood, Calif.
Distributor: Direct.

Leica—Motor

Latest addition to the Leitz line is the Leica-Motor, an accessory to be available in the near future which will aid in materializing the desires of many photographers for a camera which is practically automatic and foolproof and enables photographs to be made in rapid succession with ease.

The Rapid Winder, a special baseplate with a trigger, for making pictures in rapid succession, has been available for some time. However, for greater latitude and success in making sequence pictures a camera that will make the successive exposures automatically, entailing practically no camera movement, is necessary. Such requirements are met by the Leica-Motor.

The new accessory is interchanged with the baseplate of the Leica and when attached to the latter the whole forms a compact unit. A key on the bottom of the Leica-Motor winds a powerful spring which enables up to twelve exposures to be made automatically, releasing of the mechanism being accomplished by pressing a lever conveniently located on the front.

A scale on the Leica-Motor makes it possible to set it beforehand to automatically make the particular number of exposures required. One advantage is that its operation does not cause camera movement, and, in addition, it

allows the camera to be held firmly with both hands. This permits use of slow shutter speeds should occasion arise for this practice. Speeds at which the successive exposures can be made are one per second and two per second.

Manufacturer: E. Leitz, Wetzlar, Germany. **Distributor:** E. Leitz, Inc., 730 Fifth Ave., New York City.

Rollei Salon at S. F.

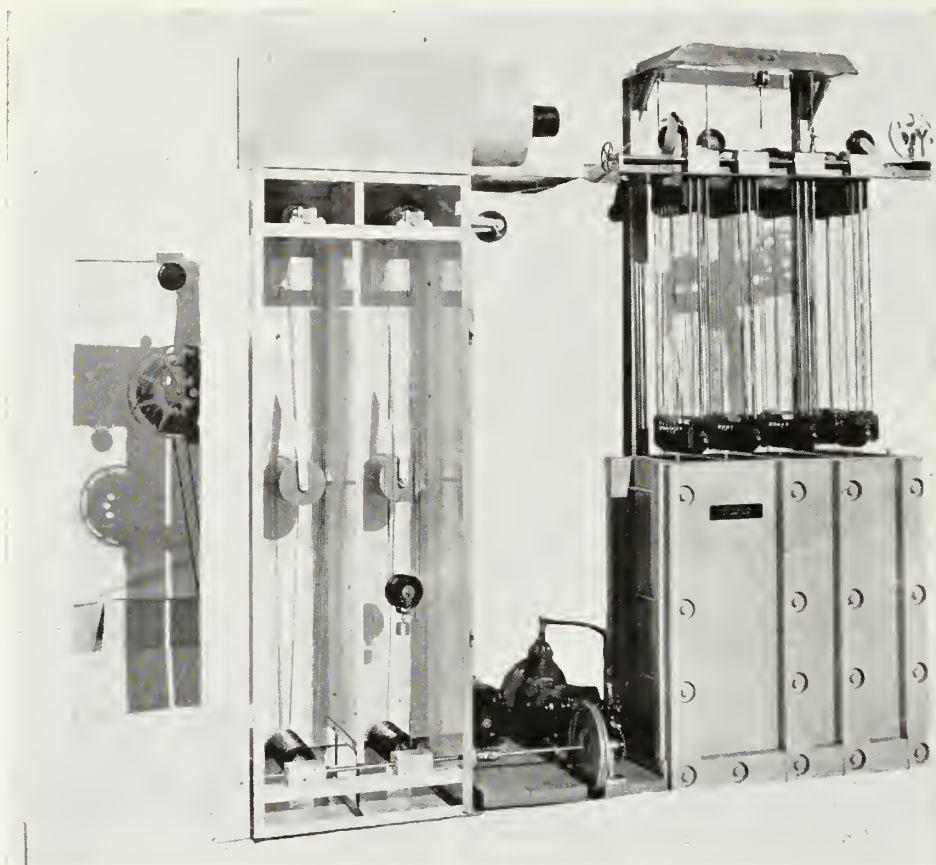
The Third Rollei Salon (first shown at Rockefeller Center, New York City, May 2-8, can be seen on the West Coast at the Photo Art Print Gallery, Monadnock Bldg., San Francisco, Calif., June 1-14. All Rollei enthusiasts and others interested in advanced amateur and professional photography are cordially invited to attend.

Kodachrome Guide

A new vest-pocket-size guide, "How to Expose Kodachrome," now available from Eastman Kodak Company for 50 cents, features a group of graphically-designed charts, bound in quick-reference booklet form. Cut-back page tabs make for easy use, allowing precise exposure for any subject, in any suitable light, to be determined in a few seconds. Large numerals and two-color printing facilitate exposure readings.

The guide also includes a "conversion dial," which provides a complete range of lens-and-shutter combinations. When this dial is set at the lens and shutter speeds indicated by the charts for any subject, it automatically indicates the equivalent lens opening for any other shutter speed from 1 second to 1/1000. Lens openings from F:22 to F:1.5 are included.

Complete data is provided for Photoflood and Photoflash pictures on Type A



New Fried Developing Machine

Kodachrome film, and instructions are included for the use of Kodachrome filters and the Kodak Pola-Screen Type 1-A.

Manufacturer: Eastman Kodak Company, Rochester, N. Y. **Distributor:** Direct, dealers.

Developer Agitation

Agitation is a recognized part of the technique of miniature film development as it enables more uniform results to be obtained than would otherwise be the case. To permit agitation to be carried out in an efficient manner the Leitz Reelo Developing Tanks are now supplied with hand agitators consisting of a rod with a knob on one end and a slot in the other which engages with a crossbar in the core of the developing reel, so that the reel is easily revolved independently of the tank itself. The Reelo Developing Tanks come in three sizes, for 35mm film, for vest pocket size film, and for $2\frac{1}{4} \times 3\frac{1}{4}$ -inch size film. They are sturdily made of Bakelite throughout. Prices on these tanks have been reduced considerably, the 35mm film size listing for \$6.00 (formerly \$7.25), the vest pocket and the $2\frac{1}{4} \times 3\frac{1}{4}$ inch film sizes listing for \$6.30 (formerly \$7.50).

Manufacturer: E. Leitz, Wetzlar, Germany. **Distributor:** E. Leitz, Inc., 730 Fifth Ave., New York, N. Y.

Spun-Glass Diffuser

A new Kodaflector Diffuser is announced by the Eastman Kodak Company. The diffuser, a disk of white spun-glass fabric 13 inches in diameter,

is mounted on a metal rim. A bracket and U-shaped rod are supplied for attaching to the socket of the Kodaflector. Softer light obtained with the diffuser is useful in informal portraiture, as well as in identification work and clinical photography. Exposure with the diffuser being about three times the exposure without it. Kodaflector Diffusers will retail for \$2.25 a pair, and single units will be \$1.25.

Manufacturer: Eastman Kodak Co., Rochester, N. Y. **Distributor:** Direct, dealers.

Developing Machines

While considerable use has been made of 35 mm. motion pictures in commercial, industrial, and educational fields, the many advantages associated with the filming, production, and distribution of 16 mm. films has resulted in a remarkable growth of this branch of the industry. The processing equipment requirements of the many laboratories throughout the United States and foreign countries engaged in this work have presented some unusual features which have resulted in the creation of several new models of the Fried Developing Machines. These new models are designed for moderately small capacity, uniformly high quality output, and to sell at reasonable cost.

Other distinctive features incorporated are: Simplified operation; complete versatility for all processing operations; compact construction with all features self contained; ease of installation; use of small quantities of developing solution; embodiment of modern proven design; precision construction and finest quality materials. The Fried machines are entirely auto-

matic and any length of film can be accommodated without cutting.

The combination 35 and 16 mm. models is designed for complete versatility in all processing requirements, and is capable of handling both film sizes—positive and negative, sound and picture. In these machines the ability to make an immediate change from one type of film to another is accomplished without any mechanical alteration or inconvenience to the operator.

Fried machines are completely motor driven and once in operation require very little attention of the operator. The operating units consist of: (1) developing tanks, etc.; (2) motor drive unit and air squeegee pump; (3) controllable air conditioning unit and film dry box.

The developing tanks form a complete processing combination consisting of a large developing tank, a "stop" bath tank, a hypo or "fixing" tank, and separate large wash tanks. While contained in one compact unit, this division of the chemical baths assures correct development with the least possibility of chemical depreciation due to "carry over" contamination. Drive is through the bottom rollers. Individual action of the upper rollers and the compensating elevators between each division of the tank, maintain a constant equalized tension throughout the processing. A variable speed control permits control of developing times for positive and negative films.

Air squeegees direct a controlled blast of air against both sides of the film before it enters the next compartment and also removes surplus water from the film before it enters the dry box. This feature in combination with the dry box film buffers assures negative that will not be spotted, streaked or scratched.

Dry box is equipped with most modern of air conditioning units, embodying a fireproof heating unit, air filter, and controllable speed circulating and exhaust fan. With this unit operator can vary heat and humidity of drying compartment to conform with developing time of film being processed. A conveniently viewable thermometer and humidity gauge is placed so that it can be observed through glass door on dry box. Dry box in addition to buffer rollers also contains film compensator which automatically controls constant tension of the film throughout machine. It also provides a safety factor to continuous development of film in case of any stoppage of machine.

When occasionally it is necessary to clean and inspect the submerged developing unit—to drain tanks, etc.—advantage of the Fried advanced design of overhead counter balanced "hoist" becomes apparent. By means of a slight pull on the cable handles, the developing rack is raised clear of the tanks to facilitate any operation necessary. This feature eliminates necessity of exterior construction of "hoist" mechanism by the purchaser—the complete installation is self contained ready to be assembled and used.

The standard 16 mm. and combination 16 and 35 mm. models are available in 500 and 1200 feet per hour positive capacities. Negative capacity is approximately one-third that of the positive.

Manufacturer: Fried Camera Co., 6154 Santa Monica Blvd., Hollywood, Calif. **Distributor:** Direct.

Camera



GOLF TIME is here with the annual studio tournaments following each other in rapid succession, so we dragged out this shot from past golf yarns of Johnny Mescall, veteran member of Local 659, IATSE, and generally conceded to be one of the industry's top flight golfers, with a number of championships to his credit, including twice winning the INTERNATIONAL PHOTOGRAPHERS tournaments. Mescall believes in shooting 16mm shots of the golf swing as one of the best methods for correcting faults.

No Picture Should Be Without Action

Motion pictures, whether fan or feature, must be based on fundamental of telling the story pictorially through camera lens.
By Herbert Aller.

While we recently "scooped" the trade and general press with our March story about the trend of public favor toward

the so-called "horse opera" type of picture, and away from the sophisticated and screwball comedy types of stories, this



These stills by Jack Koffman, member of Local 659, IATSE, from Larry Darmour's production "Lost in the Andes," starring Jack Holt, for Columbia release, give an excellent idea of photo

was not the result of any sly news hunch by this writer, who has never posed as a journalist. Our advance slant on a subject that now is becoming the big trend in current production policy, stemmed from our preoccupation with the affairs and problems of the cameramen in the studios.

Our prime interest in production affairs is influenced by the viewpoint of how the cameraman can contribute most effectively to the finished picture. And there is no question but that there are still possibilities to be opened up in greater realization that the photographer can bring important values to feature production beyond the routine technical qualities of good or outstanding photography.

In conversations with the many members of Local 659 I have been impressed time and again with their emphasis upon the need for action in motion pictures. The cracker-jack professional cameramen, whether production or newsreel, always strive to capture dramatic action on the film. This does not necessarily mean helter skelter running about to no purpose, which many people confuse with dramatic action. It means rather that in the telling of any story, there is a continual up and down surge of activity, with first one force and then another triumphing, and this ends only when one or the other force emerges with final victory. Generally audiences like to take sides and the force that they are rooting for usually is typified by the hero and/or heroine of most stories.

The expert cameraman realizes that it is the camera's function to always be



action. Given the title, the reader gets a mental picture of adventure in a strange land in these forceful scenes. They are typical of the so-called "action" pictures.

ware of this struggle, or contest, which is the essential dramatic action, and to always be alert to capture it on film with proper regard for the dramatic laws of emphasis, proportion, balance, etc. It is from this fundamental viewpoint that the theories of the proper time and place for close-ups, medium shots, long shots, etc., have been developed. It is not surprising, then, that the working theories of most expert cameramen, although not expressed in academic language—and frequently merely an instinctive attitude resulting from long experience—should fit in so aptly with the expressions of great thinkers and teachers in the dramatic medium throughout the history of literature.

The expert cameramen, therefore, brings to his work a vital, practical understanding of the most important factor in any dramatic offering, be it stage, screen, radio, television or what have you—action! Take away this essential dramatic action and you no longer have drama but mere narrative or a succession of more or less impressive pictorial effects or amusing incidents, each possibly entertaining in itself, but not bound together on the solid framework that makes for truly popular entertainment.

This yard-stick can be applied to every expensive flop production, whether musical, drawing room drama or leisurely epic, and it likewise is the explanation why many a low budget picture has company auditors opening black ink bottles, much to the surprise of the Hollywood geniuses and master minds. This quality is just as evident in the low cost smash



hits turned out by Bryan Foy's unit at Warners as it is in the more expensive hits that mark the records of the Zanucks, DeMilles, Lloyds, Selznicks and other production leaders.

In passing, it should be pointed out

that the amateur cinematography enthusiast can profit greatly in pursuing a deep study along these lines, if his amateur productions are to be anything beyond cinematographic snap-shooting.

to 64 in summer sunlight, and to 24 in Mazda light. The contrast of this film should be termed normal and superior will give excellent results when used for scenes with normal contrast. There is considerable latitude in this film. If you are out in the desert and want to increase contrast, you can underexpose and overdevelop, but overexposure and underdevelopment should only be practiced within narrow limits because fast films do not build up as much contrast as slow film. Overexposure and underdevelopment, then, might result in flatness and a consequent lack of brilliance. The developing time for a normal exposure is 19½ minutes. If the film has been overexposed in order to reduce excessive contrast, the time of development will be 17½ minutes, while if it has been underexposed in order to increase contrast, the time will be 22½ minutes.

DuPont XL Pan is something new in emulsion making, having a Weston speed of 128 to daylight and 72 to Mazda light. This film is softer working than either of the other two and this is a distinct advantage because it records shadow detail and highlight detail in almost equal intensity. The developing time is considerably longer for the same degree of contrast than the developing times of either of the other two emulsions. This film should not be overexposed. Overexposure of a normal scene should be avoided with any film emulsion because there will be a definite loss in quality in the finished print. Underexposure also is one of the chief faults of amateur photography and a great deal of underexposure will be avoided when XL Pan is used.

One of the most difficult shots in the realm of amateur photography is out-of-door portraits of people. If the subject is wearing a hat and the sunlight is directly overhead, much of the face will be in shadow. The detail in the shadows is either not recorded at all or recorded at the expense of the highlight detail. Hence, we have either black shadows under the hat and full detail in the rest of the face and the hat itself, or full detail in the shadow of the hat and blank white for all else. XL Pan will give nice shadow detail and nice highlight detail in the same picture with a minimum exposure. This film can be used for photography where there is an abundant contrast outdoors and for stage photography where someone is in the spotlight and all else is in deep shadow.

In addition to these more difficult shots, this film can be used for normal work at smaller apertures which means greater depth of focus. The objects in shade will be recorded correctly without burning up the highlights. This film will, therefore, give you contrasts as you see them with your eyes without any special manipulation of the developer. The developing time for this film is from 22½ to 24 minutes in Formula 15.

Grain size is a subject uppermost in the minds of miniature photographers. Grain structure of any film is materially affected by the developing time. If the developing time is prolonged much beyond the normal time there will be some increase in the size of the grain structure of the resulting negative. DuPont Parpan is a fine grain film and has the finest grain structure of the three. Du-

Speed Strip Photography

Series layouts supported by supplementary pictures are becoming increasingly popular with magazines; notes on strip technique.

By Jack Albin, Local 659, IATSE

Screen Guide

Speed strips of pictures in the magic eye manner have become invaluable to the fan magazines and newspapers to round out picture layouts. In some cases a picture layout may be built around one strip as in the case of the auto crash strip illustrating this story. Supplementing the action strip, pictures were used showing stuntmen, soundmen, wiring for the fire and other preparations for the spectacular scene.

I am now shooting speed strips on magazine assignments with the Robot and the marvelous depth of focus obtained with this camera under adverse conditions is well demonstrated in the crash scenes. The automobile did not land in the appointed place in the gully but jounced directly under this photographer, who made haste to yell lustily for someone to untie him from the bracings on the side of the bridge when the fire and smoke quickly made the position very uncomfortable. Yet the picture was captured from start to the close-up on the finish.

The greatest difficulties experienced with the Robot when it first was used for speed strips about a year ago was movement of the camera while clicking off the strip, and determining correct exposure. Jarring of the camera was checked by resorting to a hand and wrist strap, and the exposure problem was overcome by trial and error methods using a photometer. Your exposure must be right on the button as the frame of the picture is smaller than 35mm. used in most candid photography and the film must be processed in fine grain soup.

The rotary type shutter of the Robot is unusually accurate. It really is 1/500 of a second that you are shooting, not more or less, as is the case with some cameras. Depth of focus is to be marveled at, as at stop f:5.6 everything is in focus from 10 feet to infinity. The camera's lightness and simplicity in actual operation, also its convenient, fast re-loading, are great assets for getting difficult shots and angles. I would not attempt to use the Robot for ordinary candid shots for a number of reasons, but I believe that for speed strips it has no equal.

One practical hint to photographers

making speed shots that will save much disappointing negative is to study and practice timing on strip shots. One must develop an instinctive sense of the timing as in the golf swing. Seldom is any interesting action continuously going on at the same fixed speed. Practice will develop a sense of timing so that when the action is slowing the shutter is clicked less rapidly, and vice versa when it speeds up. Concentration on this will insure the strip having the right punch effect when laid out for publication.

DuPont XL Pan

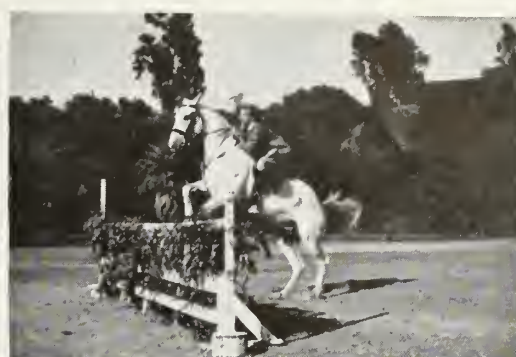
Comparison of new 35mm film with other DuPont miniature emulsions. *By Harry Champlin.*

The new XL Pan film, marketed by DuPont, is characteristically DuPont, having the dependability and uniformity which have been a feature of this company's Superior and Parpan films. In addition to these characteristics, it has a tremendous emulsion speed and a gradation more nearly equal to that given by the human eye.

In order to use this film correctly we should have clearly impressed in our minds the difference between XL Pan and the Superior and Parpan emulsions of the same manufacturer. Parpan is a slow film with a Weston rating to daylight of 16 and to Mazda light of 8. It is fine grained and capable of building considerable contrast with slightly prolonged development. Slow films require less developing time for a given contrast than fast films and, by the same rule, we can say that fast films are generally flat-working unless developing time is considerably prolonged.

Parpan develops in a relatively short time. It should be used in two different ways. First, for scenes showing great contrasts, the film should be overexposed and underdeveloped. For scenes showing little difference in tonal values, it should be underexposed and overdeveloped. In my Formula 15 the correct developing time for ordinary scenes with Parpan is 16 minutes. When it is overexposed for extreme contrast, it should be developed for 13 minutes. Underexposures to increase contrast should be developed for 22 minutes.

DuPont Superior is a rapid emulsion with a Weston speed ranging from 32



Typical speed strips series photographs made with the Robot camera by Jack Albin, member of Local 659, IATSE.

Pont Superior has a coarser grain structure than Parpan and yet if this film is correctly exposed and developed, it will yield negatives capable of enlarging to 8x10 on glossy paper without any visible grainy effect. When XL Pan is exposed and developed for 22½ minutes, the grain structure will compare favorably with the grain structure of a Superior negative which has been correctly exposed and developed. If XL Pan emul-

sion is exposed and developed for 24 minutes, there will be a slight increase in the size of the grain structure which will in turn be slightly noticeable in an 8x10 glossy print. All of the Weston speeds and developing times given throughout this article are for use with Formula 15. This formula is as follows:

Water.....	20	ounces	1000 ccs
Rubinol or Pyro.....	32	grains	3.5 grams
Sodium Sulphite.....	1½	ounces	60 grams

Acid Benzoic.....	12	grains	1.2 grams
Acid Salicylic.....	4	grains	0.5 grams
Acid Boric.....	25	grains	2.5 grams
Acid Digallic.....			
(Tannie).....	9	grains	1 gram
Glycin.....	¼	ounce	11.5 grams
Paraphenylenedia-			
mine.....	¼	ounce	11.5 grams
Alcohol Iso Propyl			
97%.....	1	ounce	50 ccs
Nickel & Ammonium			
Sulphate.....	10	grains	1 gram

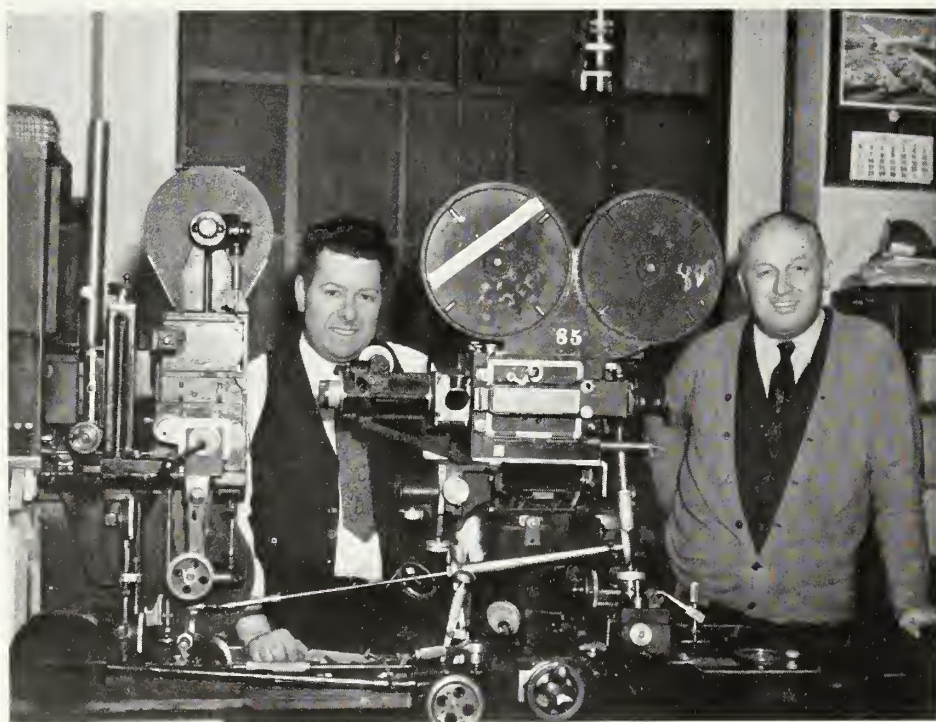
This developer should be used at 70° F.

Process

OPTICAL PRINTER HANDY ANDY

Versatility of device in taking up slack on errors wins approval from all departments for the "the studio doctor."

By Lynn Dunn, Local 659, IATSE
RKO-Radio Studio



Lynn Dunn (left) and Verne Walker, chief of the RKO-Radio special effects unit, which combines all such work under one directing head, with the optical printer, which solves many problems for all studio departments.

The complicated job of putting a motion picture together involves so many factors in which there are possibilities of a slip up that the industry has experts and special devices of all sorts to take up the slack of error. The outstanding "studio doctor" of them all, with a versatile adaptability to solving tough problems is the optical printer. Its main job, of course, is the regular duty of handling duplicate negative work and with the advent of new fine grain films, the scope of the optical printer is even greater, since the use of duplicate negative now is much less objectionable when cut in with original negative.

However, the optical printer earns its

rating as "studio doctor" and troubleshooter through a wide range of both major and minor operations on production scenes which crop up with unforeseen ailments. Nearly all departments in a major studio are benefited by this adaptability of the optical printer. The following illustrations are from actual cases on major productions:

The Cameraman's work is aided by the balancing of certain scenes in fog sequences which need more fog to smooth out the variation in density from scene to scene. It is often quite difficult for the cameraman to maintain a perfect balance in this type of work, and the optical printer is sometimes called on to double expose more fog

over the scenes which appear too thin. This is true also of rain, snow, dust, smoke, and even fire scenes. Diffusion can also be added to scenes that need it.

The Sound Department has been known to let a microphone slip down into a scene, in which case the simple job of running through a magnified duplicate negative—moving the frame to eliminate the microphone—quickly makes the scene usable.

The Director calls upon the optical printer to make closer shots from scenes already photographed. Also, longer shots are made by double exposing a painting around a reduced closeup frame, and accurately blending the picture detail from this frame to the painting.

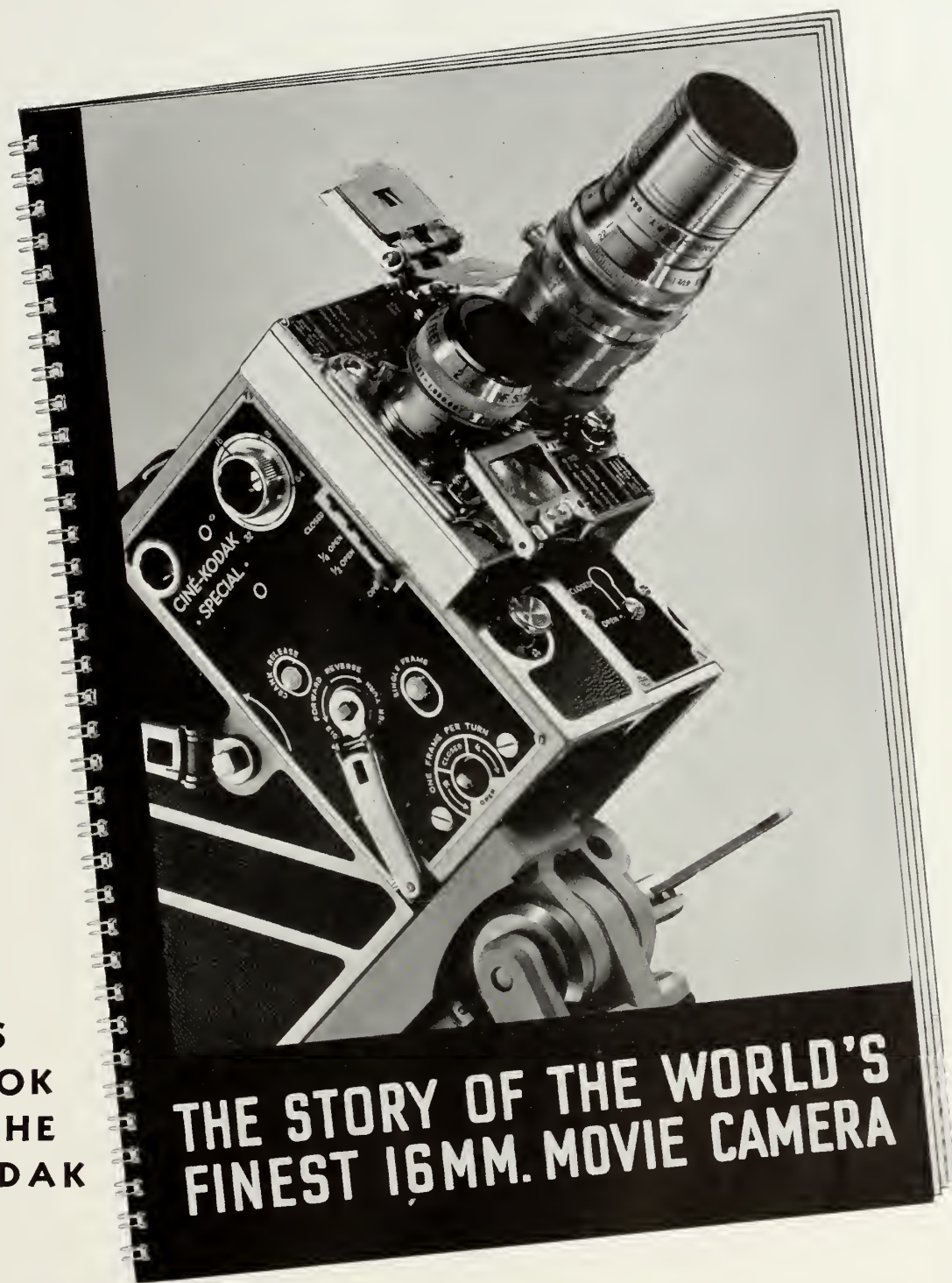
If the Art Department decides to reconstruct part of a set after it has been photographed and dismantled, the scene is run through the printer, blocking out the area of the frame where the new construction is to be put. A painting is then made of the change, and fitted into that section.

The Film Editor is confronted with numerous and varied problems which he turns over to the printer department for solution. The most important of these is perhaps the scene transition, executed by the conventional lap dissolve, wipe off, or trick effect. Also the action of scenes is reversed, as well as the direction of normal action from one side to the other. Dolly shots are made from stationary scenes in order to continue the flow of camera movement through a dissolve to dolly scenes made on the set.

The Scenario Department is thankful that it can fall back on the optical printer for the montage effect. This well-worn transition technique is used for the advancement of an important story point by impressionistic and graphic scenes, successively imposed or superimposed on a short length of film. It undoubtedly is familiar to us all, and when well done, is a highlight in any production.

The Music Department once in a while calls on "the studio doctor" to re-time a scene to line up with phrasing in music already recorded. The zooming of titles, and dissolving of scenes behind main titles is often required to be at an exact spot in a musical score.

The Property Department was once known to have left unnoticed a wrong sign on the side of a moving truck.

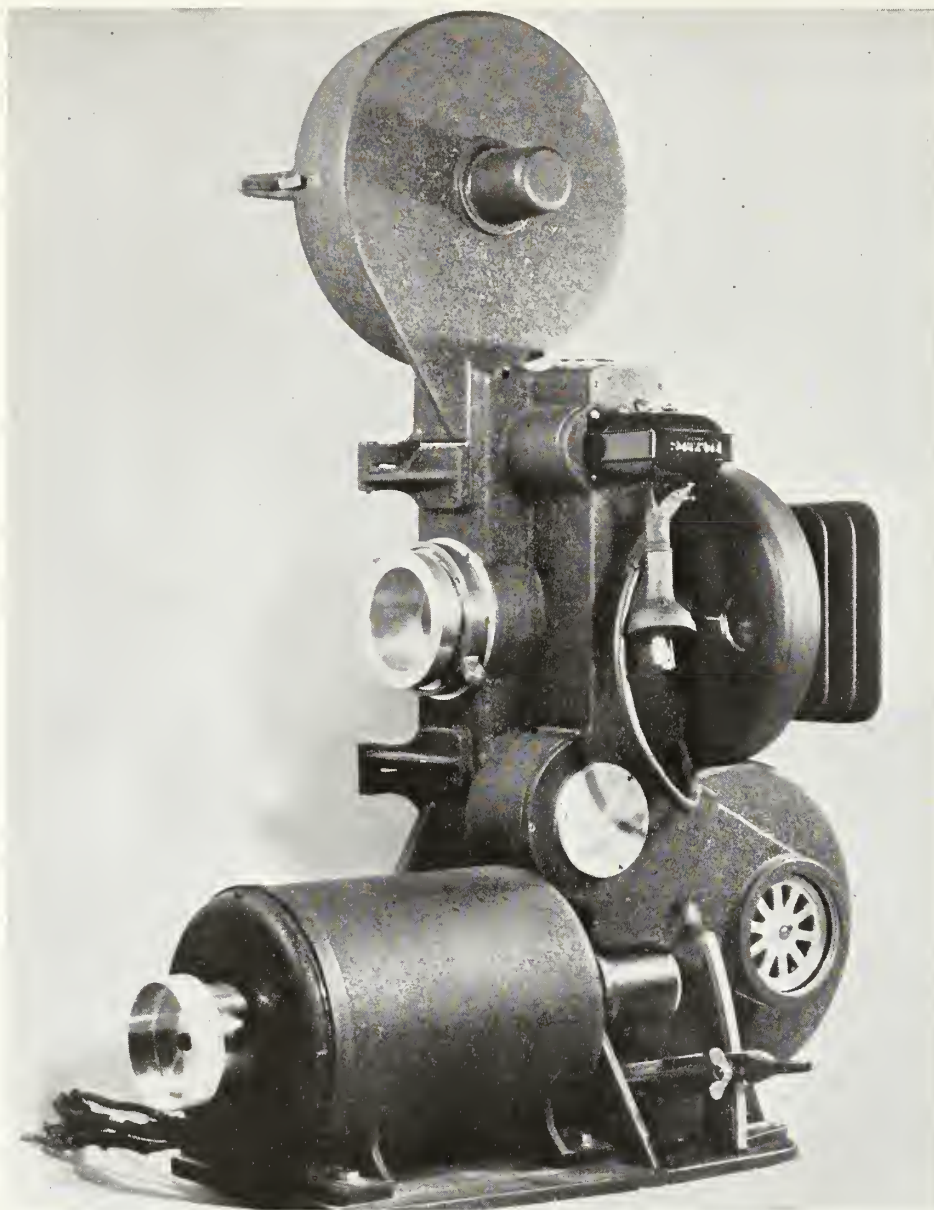


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SPECIAL**

THE STORY OF THE WORLD'S FINEST 16MM. MOVIE CAMERA

It takes this 38-page illustrated book to describe the unique advantages of the Ciné-Kodak Special. For, among its basic features are an adjustable opening shutter, reflex finder, interchangeable 100- and 200-foot film chambers, frame counter, one- and eight-frame shafts. Its scope includes animation, mask shots, dissolves, fades, multiple exposures, slow motion analysis and time lapse studies. Available are an optical finder, reflex image magnifier, electric motor drive, eight interchangeable lenses, tripod and tripod truck. Ask your Ciné-Kodak dealer for a free copy of "The Story of the World's Finest 16 mm. Movie Camera," or write to

EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



A preview shot of the new Mitchell rear projection process unit.

By manipulation on the optical printer the sign was blurred, frame by frame, so that the reading matter was obliterated.

The Film Laboratory comes in for some help with under and over developed negative. A duplicate negative of normal density is easily made, and proper correction in contrast is obtained to a remarkable degree.

Even the Actor can thank the printer for putting some real speed into his fight and chase scenes, by frame-elimination. It is obvious that comedies can often use such work to advantage.

The Paint Department has been saved retakes by the retouching on the printer of improperly painted parts of a set or property. For example, the hands of a large clock were painted so that they did not stand out plain enough to be readable under certain lighting. A little retouched highlighting on the edge of the hands, and the scene was perfect.

I might even cite a case that could be classed under assistance to the Make-Up Department. The censors ob-

jected to the extra hairy chest of a man stripped to the waist, and prominently displayed in the scene. "The studio doctor" used its substitute for a razor in this case, and retouched the hair off.

To appease the Censors, the printer has a noble record. A certain September Morn-like long shot seemed too much in evidence for censor standards, so the branch of a tree was doubled across the foreground, lending to the composition, as well as satisfying the censorship board. This really should be classified as an aid to the Landscaping Department!

An instance where the producer was saved some grey hairs and an expensive retake bill, was in the following case: A wrecked plane failed to burst into flames, as pre-arranged, at the time the injured pilot climbed out of the cockpit, clearing the plane. The flames didn't appear till he had crawled clear of the scene, thereby ruining the dramatic tension of the situation. A new prop plane would have had to been built, and the leading man brought back for another day plus the over-

head of retaking the scene. The way was cleared for a delicate major operation, with the result that the scene was dissolved to a split screen around the man, as he cleared the cockpit. In this dissolve, the action of the plane was advanced to the point where it burst into flame, while the pilot's action continued normally.

It is safe to say that the men in charge of optical printing are confronted with every conceivable type of a cinematographic repair job, and sometimes even the impossible is wanted. We usually attempt to do that, but when I recently received the request to do a usable job of taking a woman out of a bedroom set, and putting her behind a microphone in a radio station with a different dress on, I gave up!

Rear Projector

Compact, boothless and steady new background process projector added to the Mitchell line.

Following on the heels of the addition of a sound recording system, introduced in 1936, which was developed in conjunction with the engineering program for their new type cameras, the Mitchell Camera Corporation now is manufacturing a new type projection background machine for process work. This latest addition to the Mitchell line now is being demonstrated at the studios.

As pictured herewith, the new Mitchell projector is neatly and compactly designed, and operates without the need of a booth. Design and construction stem from Mitchell camera experience and the film moving mechanism is similar to the latest type Mitchells.

According to Mitchell executives, first thought in designing the new unit was reduction of noise in operation; and the second was elimination of heat from the film moving mechanism; both of which, it is claimed, have been accomplished to a surprising degree. During tests that preceded the present studio showings the machine was operated over long periods of time without any mechanical adjustment and for long periods without any appreciable heat reaching the film mechanism.

With rock steadiness a "must" for projection background work, every effort has been bent toward turning out a projector that would meet the toughest studio demands in this regard. Its steadiness won approval from studio special effects chieftains at a recent Academy demonstration at the RKO-Radio lot. Due to the limited number of persons legitimately interested in the technical details of process equipment, a complete technical description is omitted from this announcement, but Mitchell representatives will be pleased to demonstrate the new projector to any bona fide inquirer.

While Mitchell has already joined Teague and Neumatz in production of rear projectors, International Projector Corporation also is experimenting with the possibility of adapting the Geneva type movement to rear projection.

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Sound

SLYFIELD'S NEW MIXERS' GALLOWES

Disney sound chief's novel cueing arrangement for helping out the re-recording mixer an aid to better artistry in sound.
By J. N. A. Hawkins, Local 695, IATSE

Sam Slyfield, chief of sound at Walt Disney's, has dreamed up one of the most useful cueing arrangements for helping out the re-recording mixer that has appeared to date. It is called by the Disney soundman "the mixers' gallows."

As all soundmen know, the final sound negative from which the release print is made, is a composite of from three to fifteen individual sound tracks which are re-recorded in synchronism from individual film phonographs. One of these tracks will have the dialogue on it, another the effects, a third will be the music track and often additional tracks will carry extra effects, added music and dialogue. It is the function of the re-recording, or dubbing mixer to vary the volume level of each individual sound track so that levels on the composite track will have proper dramatic relationships and thus satisfy the producer.

It is entirely possible to have a hundred mixing cues per thousand feet of composite track which places a terrific responsibility on the dubbing mixer if he has to remember which cue goes where, and how much, with perhaps just a few punch marks on the action print which is being projected on a screen in the dubbing stage in synchronism with the sound to cue the mixer.

Some studios mix all the effects into one track, then mix all the dialogue on a second track after which all the music is dubbed onto one music track. This preliminary dubbing then leaves the dubbing mixer with only about three tracks to worry about, each of which is a composite track itself. While this process of splitting the job up into four or more dubbing sessions somewhat relieves the load on the dubbing mixer, it naturally takes longer and obviously costs more than doing the whole job at once. Also it has definite disadvantages from the

artistic standpoint in that it is hard to mix effects, for example, without knowing how much the effects are going to be masked by dialogue or background music, etc.

Other studios attack the problem by dubbing in very short sequences of just a few feet at a time. By this method the number of cues to remember is held down to something that the average mixer can duplicate. This system, however, is expensive due to the fact that all the tracks must be rewound and rethreaded to a "sync" mark after each short review, which again takes up time. It takes nearly as long to rewind and rethread a dummy after a hundred foot sequence as it would for a thousand foot sequence.

The new system developed by Slyfield for use at Disney's is particularly adaptable to their type of cartoons which have many more dubbing cues per reel than the average picture. However, the idea still seems very useful for general use.

Fundamental premise on which the mixers' gallows works is that every foot of the picture appears on the musical director's score, whether or not there is a *continuous* background of music. Thus, the musical director stands at the center position of the gallows with the master musical score fixed to reference locating clips on the mixing console. Each dubbing mixer has in front of him a cue book which consists of musical score sheets in blank on which are written, by a system of simple symbols, the mixing cues.

The musical director follows along the score with a metal pointer, which is attached at its upper end to a ball and socket joint on the crosspiece of the gallows frame. His metal pointer is mechanically connected to four movable cylinders in which dim lights and a vertical cross wire are located. The image of the

light appears on the cue sheet of each mixer as a small blob of dim light and follows the lines of cues on each page in exact synchronism with the movements of the pointer along the master musical score.

At points on the master musical score where there is no background music the words of the dialogue or a description, by symbols, of the effects, appears so that the musical director can always follow, on the score, the progress of the sequence as it is projected on the screen. Each mixer handles about four tracks as a maximum, and the cues for each track are written in a separate color on the cue sheet.

Cues are erased and rewritten during the progress of each review to suit the ideas of the mixer, musical director and producer, as is usual in such dubbing sessions, but the point is that once a cue is set it remains that way so that everyone can concentrate on the weak points without having to worry about duplicating the good parts of the sequence. Two or three reviews usually serves to set the cues for a whole reel and one take usually is all that is necessary.

Another advantage of the new cueing system is that if it ever becomes necessary to make a new master sound negative it can be dubbed over again from the original tracks by using the original cue sheets and there can be no doubt but that the new sound negative will be a very close duplicate of the first dubbed negative.

The Slyfield system of cue symbols is very complete and clearly describes every type of slow or fast, shallow or deep fade and eliminates most of the mental strain from the mixer. This allows him to concentrate on getting the ideal dramatic contrasts and artistic nuances into the sound as it will appear on the release print. The mechanical construction of the mixers' gallows is rather difficult to describe in detail but the lights all "track" perfectly with the pointer and the use of ball bearings eliminates practically all friction from the system.

News Mikes Hear But Not Seen

Soundmen's efforts have solved problem of getting the mike out of the way of cameramen with the "mike spider box."

By Warren McGrath, Local 695, IATSE

Fox-Movietone News

Ever since the newsreels took unto themselves their step-child, sound, the poor mechanical ear that we have pleased to dub "microphone" has been a bone of contention. It might be likened to the highly fictionized robot—that mysterious assembly of gadgets that does the bidding of a master. Unfortunately (or maybe fortunately) the robot is unable to distinguish intelligently which parts of the job to do and which to avoid. And so too is the lowly microphone cursed. Inherently it has the faculty of picking up extraneous noise with the same fidelity as desired sound.

It has been the lot of the small army of motion picture soundmen to figuratively take their robot by its duraluminum ear and force it to obey the strict requirements essential for the illusion of audible realism on the screen. The perhaps overzealous performance of this has been the cause of much weeping and gnashing of teeth by their co-workers, the cameramen.

With a view to improving the general results of sound newsreel coverage, on the basis of both sight and sound, newsreel sound technicians have devised and constructed apparatus which recently has gone a long way towards solving the constant problem of camera angle vs. microphone location.

In the limited budgets of most newsreel producing companies, there is little place for costs incurred by field experimentation in the interest of sound. It is to the great credit of the soundmen that they willingly shouldered the cost of many improvements in order that sound equipment might be used to best advantage in the field. Due in no small measure to this fact, newsreel field recording has kept pace with the demand for better and still better quality.

For purpose of comparison let us take a quick look at the technique employed in a newsreel interview, vintage of 1930. At times there were as many as four

sound cameras with attendant sound apparatus shooting the same scene. Cameramen, accustomed to artistic composition, were confronted with a picture of the rear side of four ugly looking microphones surmounted by the head and shoulders of the subject. Small wonder that wordy battles ensued between cameraman and soundman. Yet each was trying to do his part of the job in a manner guaranteeing the best possible results from their separate viewpoints. In time, however, the soundman and cameraman learned to grant concessions to each other. Microphones were placed to one side and lenses and angles were chosen which would frame out the mikes, but the result was neither fish nor fowl. In the majority of cases it was neither a good pick-up nor the best to be desired photographically.

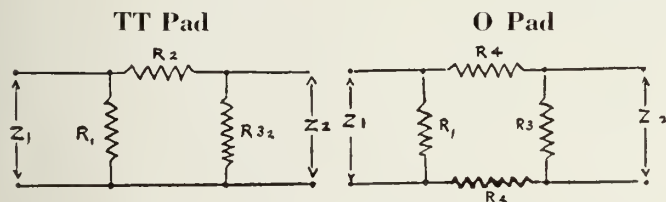
This, of course, was an impossible situation and its solution seemed to be in a device which would enable all newsreels to operate from a common microphone. To M. G. McCarroll, soundman for Paramount News, goes the lion's share of credit for working out the extremely flexible system now in use by the newsreel producing companies operating in Southern California. McCarroll, a member of Local 695, IATSE, is a graduate of Massachusetts Institute of Technology. In the methodical manner characteristic of good design engineers, McCarroll laid down a list of minimum re-

The SOUNDMAN'S BOOK of TABLES

By J. N. A. Hawkins

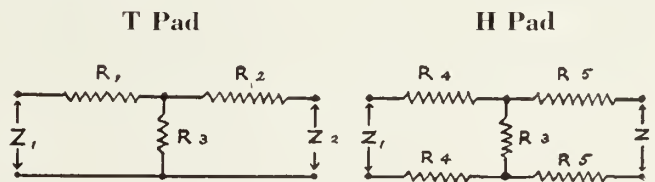
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Attenuation Network Data



$$Z_1 = 250 \text{ ohms}$$

$$Z_2 = 200 \text{ ohms}$$



$$Z_1 = 250 \text{ ohms}$$

$$Z_2 = 200 \text{ ohms}$$

Loss in D. B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4
13	.2239	297	473	292	237
14	.1995	294	573	281	287
15	.1778	291	607	272	304
16	.1585	288	685	263	343
18	.1259	281	871	249	436
20	.1000	276	1104	238	552
25	.0562	265	1990	222	995
30	.0316	259	3520	212	1760
40	.0100	253	11,140	203.5	5570

Loss in D. B.	Voltage Attenuation Ratio	R_1	R_2	R_3	R_4	R_5
6	.5012	120	36	298	60	18
7	.4467	125	46	249	63	23
8	.3981	133	64	211	67	32
9	.3548	141	77	181	71	39
10	.3162	149	87	157	75	44
12	.2512	164	107	120	82	54
15	.1778	184	131	82	92	66
20	.1000	210	159	45	105	80
25	.0562	226	176	25.2	113	88
30	.0316	236	186	14	118	93
40	.0100	246	196	4.5	123	98



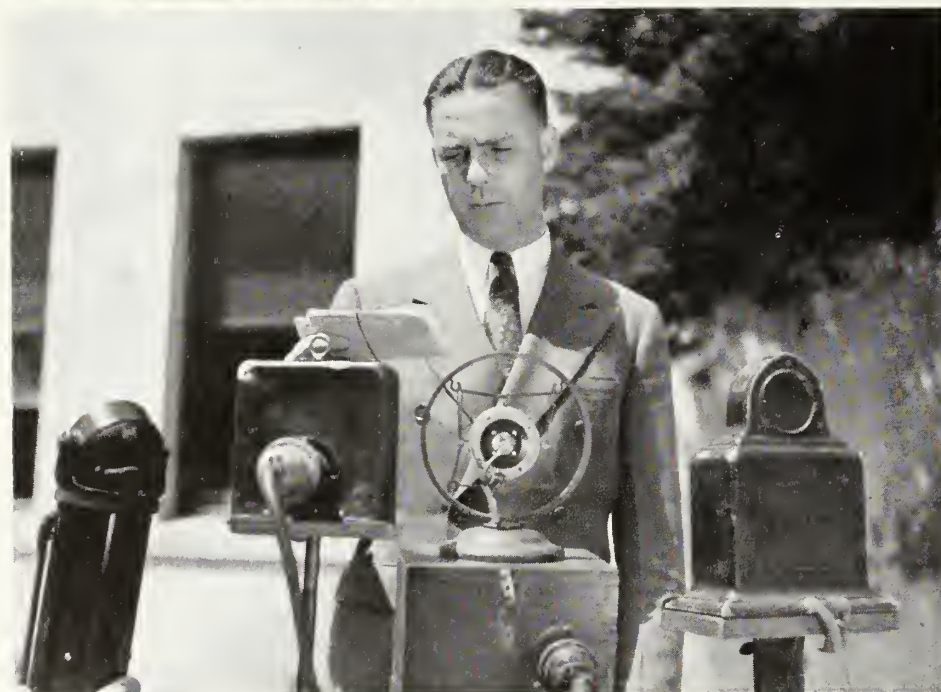
quirements to which he determined to hold. Among these were: fidelity over a range covered by all possible newsreel recordings; ability to deliver to each recording amplifier a signal at workable level correctly matched for impedance; and the necessity of absolute freedom from intercoupling effect resulting from the varied input circuits into which it had to work. Added to these main requirements was a list of secondary importance imposing enough to cause crack engineers to reach for a slide rule and a ream of paper.

The first microphone distribution system was in itself a highly satisfactory device. It was greeted with enthusiasm by the men in the field and promptly christened "The Mike Spider Box." Subsequent improvements resulted in the present ten pound affair, entirely self-contained and capable of working one dynamic microphone or a maximum of two crystal microphones into as many as five recording amplifiers. Today the Mike Spider Box is deemed as important on jobs where all newsreels are working as the microphone itself.

Of course, there still was the problem of that one microphone. A problem which was mostly solved by the sound development laboratories. Soon the small, rugged, dynamic type microphones replaced the cumbersome boxes housing condenser units and associated amplifiers. Neat black lacquered pedestal stands replaced the all too noticeable wooden tripods, but the problem of placing the microphone close enough to overcome background noise seemed still to be with us.

McCarroll and this writer cooperated in developing the next improvement—a portable microphone boom. With this boom microphones can be placed within eighteen inches of the speaker's mouth on head closeups and still be outside of the frame line. It can be assembled in about one minute and collapses to a compact bundle about four feet long and ten inches in diameter. Its weight is a mere seven pounds and when opened to its full size, reaches seven feet in the air with a 52-inch arm. It is designed to safely handle the conventional 618 type dynamic or an eight ball mike unattended.

At times, newsreel soundmen are confronted with a recording which must be done in an atmosphere of great extraneous noise. Proper suppression of unwanted noise calls for a microphone to



Compare the nondescript array of microphones in two top pictures in this layout (used in 1930) with the neat equipment and setups on opposite page. Improvement is due to development of "mike spider box," shown in bottom picture on this page. It allows five or more newsreel soundmen to record from one mike. M. G. McCarroll of Paramount News, who developed the "spider box," is the gentlemen in the pictures.



Pictures at top show M. G. McCarroll, of Paramount News, with the collapsible microphone boom now used for many shots by West Coast newsreel men. The light, portable boom was developed by McCarroll and Warren McGrath, of Movietone News, author of the accompanying story. McCarroll poses in shot at lower left with the neat new microphone stand which has replaced the cumbersome and unsightly gadgets of early sound days. At lower right is illustrated the lapel mike, which is used for interviews when there is an unusual amount of extraneous sound that would be picked up by the ordinary type of microphone.

be located within a few inches of the source of sound. This requirement was responsible for the introduction of the crystal lapel type microphone. Its weight

a matter of ounces and its size about that of two air mail stamps placed side by side, the lapel mike fitted nicely into our scheme of an inconspicuous 'close talking' pick-up. In use, the very light connecting cord is draped around the speaker's neck, usually inside of the coat collar, and is allowed to hang down behind the back. The tiny mike, to all

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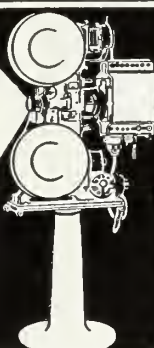
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appearances a lapel ornament, is all that is revealed to the camera. It is capable of delivering clear, crisp dialogue sound and can be successfully operated when extraneous noise precludes the use of most other type microphones.

There is one type of newsreel interview which still defies solution. Due to the fact that newsreel cameras are not silenced sufficiently and that the ponderous blimps employed by the studios are impracticable for newsreel use, the indoor pick-up is still the soundman's headache. One camera running is bad enough but when you have three or four motor driven cameras and a hand operated machine all operating at once, the recordable din is comparable to that inside of an old fashioned coffee grinder. At least two newsreel companies have equipped their cameras with a light weight blimp especially designed to be compact and incorporate the features of a rain cover and sunshade. They have proved of great service in the field. However, reverberation is such a fickle thing that one noisy camera can ruin the take for all, and their good work is nullified by the others. The apparent solution here is the use of blimps of this type on all newsreel cameras where camera noise is at a recordable level.

Probably the simplest thing that a newsreel soundman does is the actual recording of sound. His real work is the complete understanding of the overall problem presented by each newsreel story and his adaption of recording to them. Most newsreel soundmen have proven that they can be measured by the same standards by which newsreel cameramen are judged and not found lacking in any respect. No small part of the soundman's worth has been his resourcefulness in matching seemingly impossible conditions with creative ingenuity. The sound laboratory's equipment must still be adapted to the rigid requirements of field recording before proving its worth and in this the newsreel soundman seems to have done good work. After all, newsreel sound has typed itself from the very beginning as that which is recorded successfully not because of conditions—but in spite of them.

Gab Eliminator

Announcement was made last month of the development of a "dialogue eliminator" at the Warners' lot by Major Nathan Levinson, head of the sound department, and his aide, W. A. Mueller. The studio has applied for patents on the device, which permits the saving of much time and expense in re-dubbing for the foreign market. The machine now is being used at the studio for this purpose. As it re-dupes, it automatically skips parts of film in which there is dialogue, but records music and sound effects. More detailed information will be published in July INTERNATIONAL PHOTOGRAPHER.

News of the Month

Continuation of SMPE Papers

More abstracts of the latest information on technical progress and future prospects from the Society's spring convention.

Because of considerable interest by many readers of *INTERNATIONAL PHOTOGRAPHER*, who file their copies as a record of technical news, we are devoting this month's news section to the continuation of the papers presented at the Society of Motion Picture Engineers' Spring Convention at Washington in April. This is one of the largest and most interesting array of papers presented before the SMPE in some time. Because of special interest in the first report of the SMPE's survey of theatre conditions, the full text of the report, which will be available for the July issue of *INTERNATIONAL PHOTOGRAPHER*, will be published in full.

"A Continuous Optical-Reduction Sound-Printer";

M. G. Townsley, Bell & Howell Co., Chicago, Ill.

Optical-reduction printing from 35 mm. negative to 16 mm. positive has come into wide use. New printer has been developed for making optical-reduction prints, which departs from conventional design in that film rolls are horizontal, making possible oil-damped filters and flood lubrication without friction-producing oil-seals. Printer operates in either direction and stops automatically at end of negative. A three-phase, 220-volt synchronous motor drives main worm shaft from which all working parts are driven at printing speed of 60 feet of 35 mm. film per minute. Uniform film motion is achieved by heavy flywheel and independently filtered drive to each film drum.

Self-contained optical unit produces on 16 mm. film an image of 35 mm. track moving in synchronism with 16 mm. film, with longitudinal and transverse magnifications of 0.40 and 0.84, respectively. Provision is made for printing masking lines at edge of track. A 10 volt $7\frac{1}{2}$ -ampere d-c. lamp is operated from pair of 6-volt storage batteries and full-wave charger. Lamp current is controlled by rheostat and ammeter.

"An Automatic Camera Timer for Time-Lapse Cinematography";

H. Roger, Rolab Photo-Service Laboratories, Sandy Hook, Conn.

Ever since invention of motion picture, time-elapse cinematography has been used extensively to speed up slow actions. More or less complicated devices have been constructed, mostly by cameraman himself, to take single exposures at various time intervals. In modern cinematography, especially in industrial and scientific field, time-lapse photography has found great many new uses in recording slow processes. Camera timer described in this paper operates not only camera but also light, in synchronism with the camera shutter. Timer is result of more than twenty years of practical experience in this field.

"New Piezoelectric Devices of Interest to the Motion Picture Industry";

A. L. Williams, The Brush Development Co., Cleveland, Ohio.

Devices discussed are: (a) phonograph pick-up with uniform response (without further compensation) 30 to over 10,000 cps. with forces so low as will reproduce this range from soft direct recordings with negligible wear; (b) record cutter which, used in conjunction with pick-up, will record over same range; (c) high-fidelity headphones reproducing to over 10,000 cps. with high sensitivity and high impedance (over 7500 ohms per pair); (d) unidirectional microphone (changeable at will to bidirectional or non-directional) using ribbon pressure gradient and sound cell pressure unit.

"Characteristics of Supreme Panchromatic Negative";

A. W. Cook, Agfa-Ausco Corporation, Binghamton, N. Y.

New panchromatic negative film is compared with earlier types of supersensitive material. It has a light-sensitivity twice as great as that of Superpan. This, it is claimed, permits a 50-per cent reduction in set lighting, or use of smaller lens aperture for gaining greater depth of field with undiminished illumination. Relative color-sensitivity is substantially unaltered. Film is doubly coated, with two emulsion layers superposed upon gray antihalation layer between emulsion and support. Despite increased sensitivity, Supreme negative has equally good keeping qualities, finer grain, and lower developing fog than Superpan. Development characteristics are similar and no alteration of laboratory procedure normally employed for typical supersensitive materials is suggested, although long scale film allows great latitude in development. Extremes of light and shade beyond limits imposed by earlier supersensitive materials can be recorded faithfully, as indicated by long straight-line portion of characteristic curve, very short toe, and shoulder falling in region of densities far beyond those encountered in practice. Advantages are reflected in quality of negatives taken under adverse lighting conditions.

"A Roller Developing Rack with Stationary Drive";

C. E. Ives, Kodak Research Laboratories, Rochester, N. Y.

In a previous paper rack was described that provided for continuous motion of 200-foot length of motion picture film during processing but could be used with rack-and-tank equipment. Purpose of this roller rack was to give type of treatment in processing essentially similar to that given by continuous machine while retaining features of batch equipment that are helpful in experimental processing.

Rack previously described included built-in driving motor and reduction gear, an arrangement that was most feasible for a single unit. With more extensive use it became desirable to have multiple units operated from stationary drives at tanks and at loading and unloading stations.

New design has been worked out in which weight of rack was reduced greatly by use of stationary drives. Further reduction in weight was attained by substitution of tensioning springs for weighted supporting beam associated with movable lower shaft in earlier model. This shaft was mounted upon frame by lever arms in such a way as to use torsional rigidity of shaft itself to maintain it parallel to upper shaft while allowing necessary vertical movement.

"A New Projector Mechanism";

H. Griffin, International Projector Corp., New York, N. Y.

This new projector is provided with synchronized front and rear shutters operating in same direction and providing considerably greater screen illumination; an automatic fire-shutter safety trip for fire prevention; a Bijur one-shot oiling system to provide positive lubrication under pressure, together with ball bearings having sealed lubrication for extremely long service; heavier film-gate construction, entire unit being readily removable for cleaning and having adjustable tension devices and locking positively both in open and closed position; readily removable film-trap having edge-guiding means and provision for easily cleaning and replacing worn film runners; new ring-type fire-shutter governor; easier threading facilities; new automatically positioned threading lamp; illuminated pearl gray enamelled interior; and other distinctive improvements.

"A Film Cement Pen";

R. J. Fisher, Rochester, N. Y.

Purpose of this device is to make application of film cement in splicing film easier and neater, and allow no waste of cement by spilling or evaporation. It replaces bottle, brushes, medicine droppers, etc., and is time-saving element where necessary to make many splices, as in film exchanges, studios, and laboratories.

"Motion Picture Projection from Metallic Sound";

R. W. Carter, Taylor-Sloane Corp., New York, N. Y.

Brief history is given of various processes for putting photographic images on metallic surfaces and evolution from flat surfaces to flexible metal ribbons is discussed. Subject of metal films is traced under following headings: Physical and mechanical difficulties in the development of a metal strip suitable for projection; physical, chemical, and mechanical properties necessary for the photographic emulsions and photographic developers; effect of mechanical strain and the heat of the projection machine upon the metal film; relative wearing quality of metal film as compared with that of cellulose film; possibilities of coating both sides of the metal strip and the development of printing machines to print thereon; making original master negatives on standard photographing equipment; dubbing positive prints from the master metal negative; optical system best adapted for getting the highest possible reflection from the polished surface of the metal film; comparison of light transmission from celluloid and metal films; effect of heat upon the image on a metal film;

Can a metal film be joined rapidly if it comes apart? A comparison of shrinkage between metal film and cellulose film; what evidence have we of the permanence of metal film? Will it be possible to develop color on metal film, and will the use of prisms make it possible for successful projection? What changes will the operator have to make in technic and general practice? Why will the sound be more accurate from a reflected image? Will it be possible in the future to use a series of sound-tracks in various languages on the metal film? With the elimination of the fire hazard shrinkage, and the introduction of less weight and positive permanence, what are the chief defects to be expected in metal film, and what is proposed to overcome these defects?

"The Theory of Color Reproduction";
A. C. Hardy, Massachusetts Institute of Technology, Cambridge, Mass.

All methods of three-color photography are outgrowth of suggestion made in 1855 by Clerk Maxwell, illustrious British physicist. Method he suggested would now be classed as an additive process, since final reproduction was effected by projecting three lantern-slides in register on same screen; one lantern being supplied with red filter, one with green filter, and one with blue filter. Maxwell suggested further that these lantern-slides be prepared from three negatives, each negative being exposed through same filter that was to be used in projecting corresponding lantern-slide. Extension of Maxwell's reasoning to subtractive processes leads to conclusion that dyes used in production of positive images should each be complementary in color to corresponding taking filter.

Despite Maxwell's intimation that his process was theoretically incapable of perfect reproduction, basic features of Maxwell's reasoning have been incorporated into commonly accepted theory of color reproduction. Recent progress in science of colorimetry has made it possible to investigate relation that should obtain between the characteris-

tics of taking filters and colors of the reproduction primaries. Such as investigation shows that taking filters required for perfect reproduction have characteristics that are very different from those in common use.

This paper is concerned with establishment of conditions that lead to faithful reproduction by any three-color process. Examples of application of these fundamental conditions are given for both additive and subtractive processes.

"Screen-Film Negative-Positive Process";

T. T. Baker, Dufaycolor, Inc., New York, N. Y.

Progress in two directions has greatly simplified the making of prints from screen-film negatives. Study of emulsion characteristics and of mechanics of development with silver bromide solvents has led to avoidance of color dilution in copying one screen material from another. Sodium thiosulfate in a metol developer has been shown to localize development in the lower strata of the film, so that silver image is formed in close contact with reseau, largely eliminating scatter at boundaries of differently colored units; crystalline structure of silver salts and grain-size frequency also assist in preventing scatter. Residual color dilution as the result of 45-degree oriented reseau is explained, and way in which this has been counteracted by suitable choice of gammas in the negative and positive material. Production of a vapor-lamp emitting line spectra of mercury and cadmium without appreciable spectral background, combined with liquid didymium chloride filter has provided triple monochromatic light-source, spectral lines of which coincide with peaks of reseau transmission, thereby eliminating dilution of color due to overlap, such as has always previously been present with color filters of narrow-cut type. Dufaycolor contact printing machine with automatic control of both hue and printing light is described. Technics of printing and development with standard equipment, are described with lantern-slides and projections of recent 35 mm. cine prints (which are at present circulating in English theatres).

"Problems Involved in Full-Color Reproduction of Growing Chick Embryo";

E. S. Phillips, New York State College of Agriculture, Cornell University, Ithaca, N. Y.

Attempts to record on 16 mm. color-film physiological changes that take place during 21-day incubation period of hen's egg presents problems varying with each day's growth. Because author was working with living subjects that required strict adherence to narrow tolerances in order to maintain normal embryological development and even life itself, it was necessary to adapt photography to problem.

Development of embryo is shown in three different ways, i. e., (1) transmitted light, with shell entire; (2) removal of part of the shell, and subsequent photography by reflected light; and (3) removal of entire shell, and placing the embryo in a watch crystal, thus showing all parts of their relative sizes.

In all three methods, temperature, humidity, and light control constitute the major problems.

"A Method for Determining the Scanning Loss in Sound Optical Systems";

E. D. Cook, General Electric Co., Schenectady, N. Y., and V. C. Hall, Eastman Kodak Co., Rochester, N. Y.

Usual methods of evaluating frequency characteristics of sound records have been satisfactory for determination of required correction for overall losses. However, losses due to aperture and optical effects are not known with sufficient precision to permit an inferior limit to be assigned to film loss only.

Method described was chosen in connection with high-fidelity development, and consists in comparing direct measurements made on images formed by contact printing of geometrically shaped test-object on film with measurements of frequency records made using recorder optical system. While results obtained can not be applied generally, method is capable of segregating film loss from other losses for specific conditions under which test is conducted.

"An Optical System for the Reproduction of Sound from 35 mm. Film";

J. H. McLeod, Kodak Research Laboratories, Rochester, N. Y., and F. E. Altman Hawk-Eye Works, Eastman Kodak Co., Rochester, N. Y.

An optical system has been designed and tested for use in 35 mm. sound reproducers. It is the slitless type of optic, and gives scanning image 0.001 inch wide when used with exciter lamp having coil diameter of 0.055 inch. Toric lens is used to form curved-line image of filament of lamp. Curved image is then re-imaged by highly corrected objective lens of numerical aperture 0.28. Objective lens has inherent curvature of field, but curvature is compensated for by curvature of line-image formed by toric lens so that final image is flat. Toric lens also acts as condenser lens to throw image of filament into objective lens. Careful tests of samples show that final image is flat, straight, and of uniform width and intensity.

"Sound Recording by Color Modulation (Van Leer System)";

A. L. W. Williams, Brush Development Co., Cleveland, Ohio.

Method of recording sound is described in which advantage is taken of variation in sensitivity of photographic film to light of different wavelengths. On standard film there is portion of sensitivity-wavelength curve in which sensitivity changes linearly over wide range with small change in wavelength or color. Optical system and apparatus are described, designed to vary color of recording light over this narrow band and capable of wide-range recording. By this system very small deflection of recording galvanometer is required, enabling simple crystal oscilloscope to be used for purpose. Chromatic aberration is almost eliminated. Large errors in exposure or development may easily be corrected so that minimum distortion occurs.

Report of the Standards Committee;

E. K. Carver, Chairman.

Tentative drawings that have received initial and final approval by Standards Committee have been published in the March issue of the Journal of the Society. Uncompleted items at present under consideration are:

(1) Drawings for standard cores for

cine film.

(2) Further consideration of proper separation distance between two halves of push-pull sound-track.

(3) Drawings of sprockets for 16 mm. sound-film.

(4) Revision of standard release print to correspond with revisions made by Academy Research Council.

(5) Review and possible revision of glossary of technical terms.

(6) Carrying out actual tests on new sprocket perforation for 35 mm. film, which it is hoped, will displace old Bell & Howell perforation.

"An Ultraviolet Push-Pull Recording Optical System for Newsreel Cameras";

G. L. Dimmick and L. T. Sachtleben, RCA Manufacturing Co., Inc., Camden, N. J.

Recent advances in sound recording technic, notably exposure with ultraviolet and Class B push-pull track form, are incorporated in a variable-width recording optical system of extraordinary compactness for newsreel work. Overall dimensions are approximately 6 inches long by 4 inches wide by $3\frac{7}{8}$ inches high, and the weight complete is about $3\frac{1}{4}$ pounds. Compact form is made possible by development of new galvanometer window lens of very special form, and of objective lens of 7.6 mm. E. F. and f:2 speed which will cover sound-track width satisfactorily. Power drain of exposure lamp is 21 watts at 4.9 volts. Galvanometer input at full modulation is about 30 milliwatts.

Class B push-pull track inherently provides ground-noise reduction without use of special equipment. Response of print at 6000 cps. is 3 db. below that at 1000 cps. with ultraviolet light, and 6 lb. below it with white light. Turn of lever and reduction of lamp current to 3 amperes prepare system for white-light recording when battery power must be conserved and quality is less important.

"Processing Ultraviolet Recording on Panchromatic Films";

J. O. Baker, RCA Manufacturing Co., Inc., Camden N. J.

Necessity in newsreel work of making original sound recording on panchromatic film has always meant serious sacrifice in quality and ground-ratio, as compared with results attained when sound is recorded on separate film. While ultraviolet recording materially increases fidelity of response, with panchromatic as well as with standard sound negative film, low contrast and inherently high base fog of panchromatic film when processed for negative picture development produces noise and considerable reduction in volume range.

Track density on panchromatic film is rather low, of the order of 1.0 to 1.2, when recorded with practical optical system for single-film system. When this track is printed upon commercial release print stock dense portion of negative track will print through, producing fog density in clear portion of printed track. Fog in clear portion tends to produce noise and reduces volume range. When panchromatic negative and print are processed in accordance with commercial practice, reduction in volume range is of the order of 6 decibels.

Printing panchromatic negative upon high-contrast emulsion improves both noise and volume range. Since release prints must be on standard picture positive stock and not on high-contrast

film, it is here proposed to make master positive on high-contrast emulsion and to re-record from this to standard sound negative, which would be used in ordinary way to make release prints. Improvement in release print ground-noise of 8 to 12 decibels is obtained by method, and volume range is increased by 6 decibels. Briefly, proposed method is means for increasing density contrast of final release print track when original is recorded on panchromatic film.

"Design and Operation of Theatre Loud Speaker Systems";

J. F. Blackburn, Lansing Manufacturing Co., Los Angeles Calif.

Although really satisfactory loud speakers have been commercially available for only a comparatively short time, all essential elements of good loud speakers have been at hand for many years. Reasons for late appearance of suitable units must be sought in economic rather than technical field.

Loud speaker with its horn and other adjuncts is considered analogous to antenna and plate circuits of radio transmitter. It is pointed out that probably only in acoustics and in radio transmission do we have to be so wavelength-conscious, since only in these cases do wavelengths of interest range from very small to very large, compared with apparatus dimensions. This wide range at once denies use of types of simplifying assumptions that are so convenient in other fields, and introduces several sets of mutually contradictory requirements for apparatus. To date, apparently no one has succeeded in fulfilling all requirements in single piece of apparatus, so that it becomes necessary to use multi-channel systems with appropriate frequency-dividing networks.

One solution to requirements just outlined is discussed in detail from engineering point of view. Comparatively meager published design data are reviewed and commented upon in light of author's experience with units described. Some information is given regarding possible modification of performance by minor changes in units. Experiences in application of units in field are discussed and suggestions are given to users.

"Push-Pull Recording with the Light-Valve";

J. G. Frayne and H. C. Silent, Electrical Research Products, Inc., Hollywood, Calif.

Push-pull recording on film is accomplished by means of double light-valve having four ribbons. Distortions introduced by recording medium which are represented by second-order harmonics balance out in reproducing, as do also frequencies introduced by action of noise-reduction system. As result, push-pull recording not only eliminates certain defects of conventional recording but permits application of new technics that allow further extension of volume range and improvement in naturalness in final product.

"New Uses for Instructive Motion Pictures";

H. Roger, Rolab Photo-Science Laboratories, Sandy Hook, Conn.

Problems are described that were encountered during production of several motion pictures with sound for New York State Department of Health. Films represent type that has found new uses in instructing physicians and nurses, as well as general public, in treatment of

pneumonia patients. They represent part of a nation-wide campaign program against spread of pneumonia.

"Making an Industrial Film";

J. A. Norling, Loucks & Norling Studios, New York, N. Y.

Industrial films can be classified as sales films, which are made for purpose of putting sales message across to prospective consumer; sales-training films, devised to train salesmen and not planned for public use; educational films, which may contain some sales-promotional material, advertising films, which are usually very short bits released in theatres. Of many industrial pictures made in last few years, by far most important are those classified as sales, sales promotional and sales-training.

Problems that arise in production are discussed. Increasing demand for color has set up many new problems for producer of industrial motion pictures and slide-films. Growing appreciation of high production quality among industrial clients has also increased difficulties and expense of producer. These matters are touched upon but main portion of this paper is devoted to one typical film—a detailed case history of its making, from original scenario to ultimate use of film in reaching market.

"An Industrial Visual Instruction Laboratory";

J. G. T. Gilmour, General Electric Co., Schenectady, N. Y.

History, methods of operation, equipment, and types of work are described of section of General Electric Co. that prepares, produces, and distributes pictures, used by the Apparatus and Supply Division of the company.

"A Higher-Efficiency Condensing System for Motion Picture Projectors";

F. E. Carlson, General Electric Co., Cleveland, Ohio.

In motion picture projection optical systems for tungsten-filament sources, condenser design is such that source is imaged well ahead of picture aperture. This position is dictated by considerations of uniformity of screen brightness. It is not optimal position from standpoint of utilization of light, for it entails losses at aperture. At best position for efficiency, degree of brightness uniformity is unacceptable because of non-uniform brightness of source. This paper describes method for reducing such losses without sacrificing picture quality.

"A Water-Cooled Quartz Mercury Lamp";

E. B. Noel and R. E. Faruham, General Electric Co., Cleveland, Ohio.

Structure of the water-cooled quartz mercury lamp, its operation, quality of radiation, brightness, and source size limitations are first described, followed by discussion of power-supply equipment, both a-c. and d-c. Applications of lamp are as follows:

(1) Motion picture projection, both with single lamps and with several sources.

(2) Motion picture photography, both black-and-white and color. This part of the paper tells also of application to very high-speed motion picture photography. For black-and-white photography lamp is quite satisfactory. For color work relatively limited red radiation may call for external methods, either in use of fluorescent reflect-

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tors or highly red-sensitive emulsion, to make up for this deficiency.

(3) Film printing. Because of relatively high output in blue-violet and ultraviolet regions lamp may prove very satisfactory source, especially where advantage is taken of ultraviolet radiation.

Following additional applications of secondary interest motion picture industry, are also discussed: photo-enlarging, photoengraving, and searchlights.

"Theory Vs. Practice";

F. H. Richardson, Quigley Publishing Co., New York, N. Y.

Attention is directed to discredit heaped upon the splendid work accomplished by scientific men in designing apparatus employed in projection, and upon the praiseworthy accomplishments of construction engineers in carrying those designs forward into completed equipments. Apparatus can not be made to function efficiently in theatres while men are in charge who lack practical and theoretical knowledge. The public, for the most part, is unable to form intelligent opinion as to where the fault for poor functioning lies, and almost invariably will credit it to imperfect equipment. Suggestions are offered looking toward placing theatre projection equipment in the hands of thoroughly capable men, to end that the equipment may be made to produce results of which it is capable and to last a maximum length of time in service without excessively high operating expense.

"A Technic for Testing Photographic Lenses";

W. C. Miller, Paramount Productions, Inc., Hollywood, Calif.

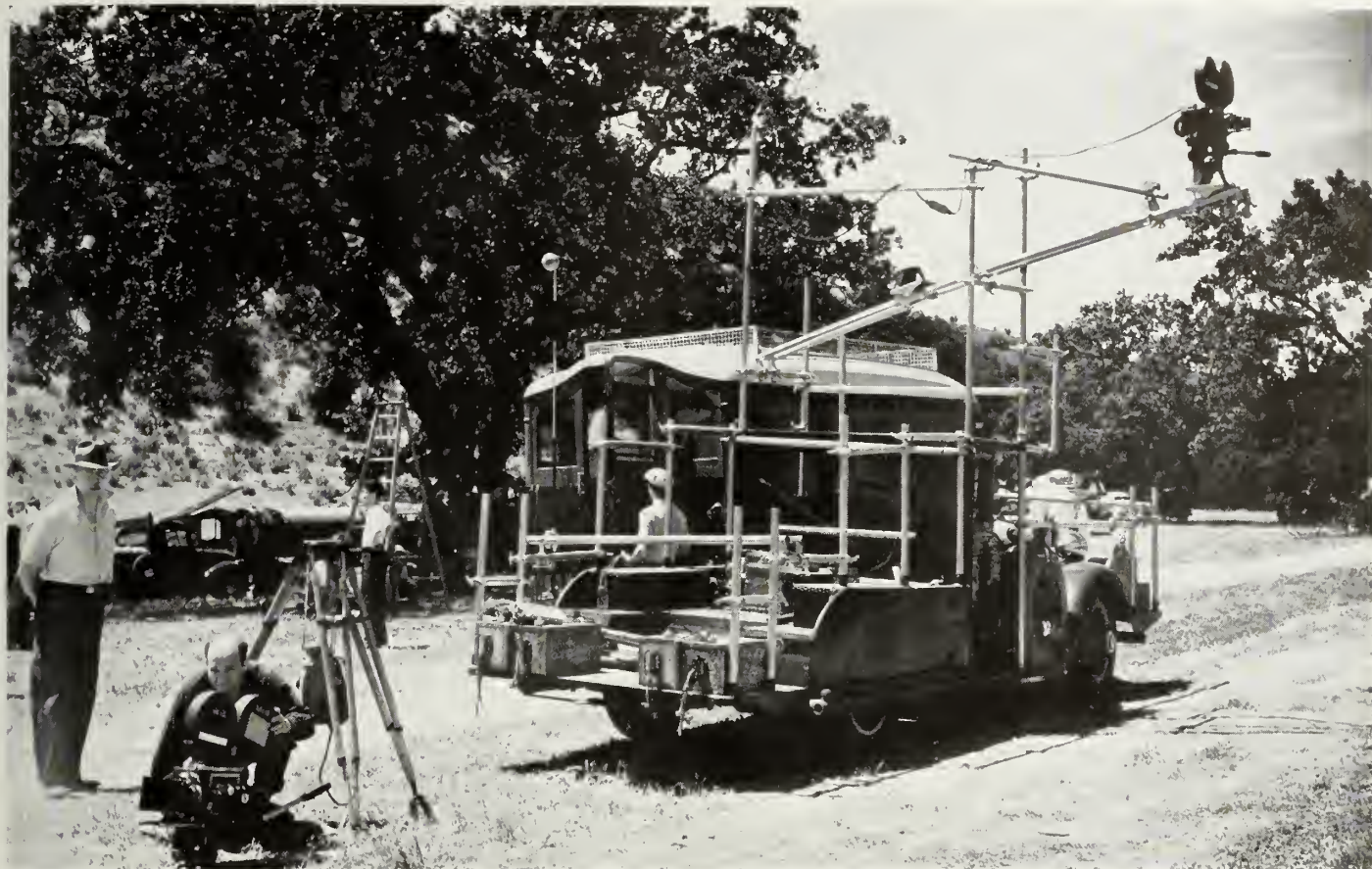
Different makes of lenses have different properties and characteristics which may render a lens ideal for one purpose and totally undesirable for another. Lenses of a given make and series often vary in quality among themselves. To obtain best type of lens for specific purpose it is necessary to subject various makes obtainable to tests that will reveal characteristics in such a way that they can be reduced to numerical quantities for comparison. Once type of lens for specific purpose has been chosen, it is of great importance to be able to select best of that type from group submitted by manufacturer.

Equipment and technic used in tests that make such discrimination possible are described. A few general hints and precautions are given that will aid in determining characteristics most desirable for various purposes. Special emphasis is placed upon tests for lenses intended for use with standard 35 mm. equipment. It is simple matter to apply methods and principles to other classes of lenses.

"Some Unusual Adaptation of 16 Mm. Equipment for Special Purposes";

J. L. Boon, Development Department, Eastman Kodak Company, Rochester, N. Y.

A casual observer, looking over existing standard amateur photographic equipment, would probably be of opinion that there is little need of altering a camera to do a special job. However, closer observation of various problems that photography serves reveals that standards of practice have been chosen merely to suit needs of a common majority of users, and minority



VERSATILE CAMERA CAR is this latest device, now offered for studio rentals by Jack O'Hare, veteran expert in camera cars and electric horses. The new car, as clearly illustrated, provides for over 50 possible setups, including from 6 inches above the ground to 16 feet. It carries five tripod heads for Mitchell and Bell & Howell cameras. The car is mounted on a

Lincoln chassis and has been specially designed to carry the cameras and crew at speeds as fast as 60 miles per hour with safety and insuring steady photography. It also is equipped with movable reflector stands and other unique features. Irving Klein, member of Local 659, IATSE, is the assistant busy in foreground.

are almost forgotten. Further observations show that alteration to standard camera to make it fit a specific purpose usually precludes its usefulness for many of purposes for which it was originally designed, also its utility for other special purposes.

Attempt has been made in this paper to make known some of the unusual adaptations of 16 mm. motion picture equipment, each to fulfill a definite purpose, and to show that industry is becoming more conscious of utility of such photographic equipment as tool in solving some of its problems.

"A New 16 Mm. Projector";

H. C. Wellman, Camera Works, Eastman Kodak Company, Rochester, N. Y.

New projector is housed completely in aluminum die-castings, and to provide quietness of operation, pull-down gears are individually adjusted in assembly by means of eccentric sleeve. To facilitate threading, location of pull-down claw is designated by threading knob, position of which can be detected by touch and sight. Throwing single lever engages rewind mechanism and at same time releases lower reel.

A threadlight is built into projector, so positioned as to be most effective for threading gate and sprockets. Single control switch, a new and unique feature, has four positions; first is off position; second turns on threadlight so that machine may be easily threaded in darkened room; third turns on motor (threadlight remains on so that

operator can momentarily see that loops are properly formed and that projector is functioning properly); fourth turns on projection lamp and turns off threadlight.

"A Criticism of the Proposed Standard for 16 MM. Sound-Film";

J. A. Maurer and W. H. Offenbanser, Jr., The Berndt-Maurer Corp., New York, N. Y.

It has been proposed that standard dimensions of 16 mm. sound prints be changed, principally by widening sound record and scanned areas. Question is reviewed from standpoint of cumulative effects of film shrinkages and mechanical inaccuracies in steps leading to final sound print and in projection of that print, following method described by R. P. May in April, 1932, SMPE Journal.

A film having sound records of various widths was demonstrated to support contention that increased width of sound-track is not needed, and that if any change from present standard is to be made, it should be in direction of narrower track to provide wider margin outside sound-track and wider safety area between sound-track and picture.

"The Shrinkage of Acetate-Base Motion Picture Films";

J. A. Maurer and W. Bach, The Berndt-Maurer Corp., New York, N. Y.

A simple direct-reading film-shrinkage gauge has been constructed with which shrinkage readings may be made in a few seconds. Accuracy of instru-

ment is such that maximum variation in series of readings made upon particular film will not be more than 0.02 per cent of predetermined length measured. Readings have been taken systematically with this instrument over period of five months to determine shrinkage behavior of acetate-base films under various conditions of storage and use.

Results indicate that safety-film base made by each of three American manufacturers has characteristic value of shrinkage that is ordinarily reached within few days after processing. Subsequent shrinkage is slow but continuous over long period of time. Ultimate value of shrinkage is of order of 1.25 per cent except in case of films that have been projected many times on projectors using high-wattage lamps. Bearing of this shrinkage information upon equipment design is discussed briefly.

"A New Framing Device for 35 Mm. Projectors";

H. A. DeVry, Herman A. DeVry, Inc., Chicago, Ill.

This device embodies unique application of silent chain drive to motion picture mechanism, so that up or down movement of film effected by framer is accomplished without disturbing synchronism between shutter and intermittent. Also, since framing is done by overhanging arm built directly onto intermittent, intermittent moves only rotationally, and remains always so close to aperture that there is no room for buckling of film.

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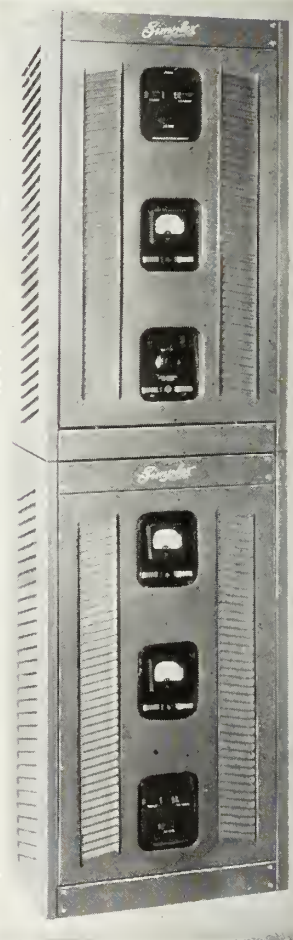
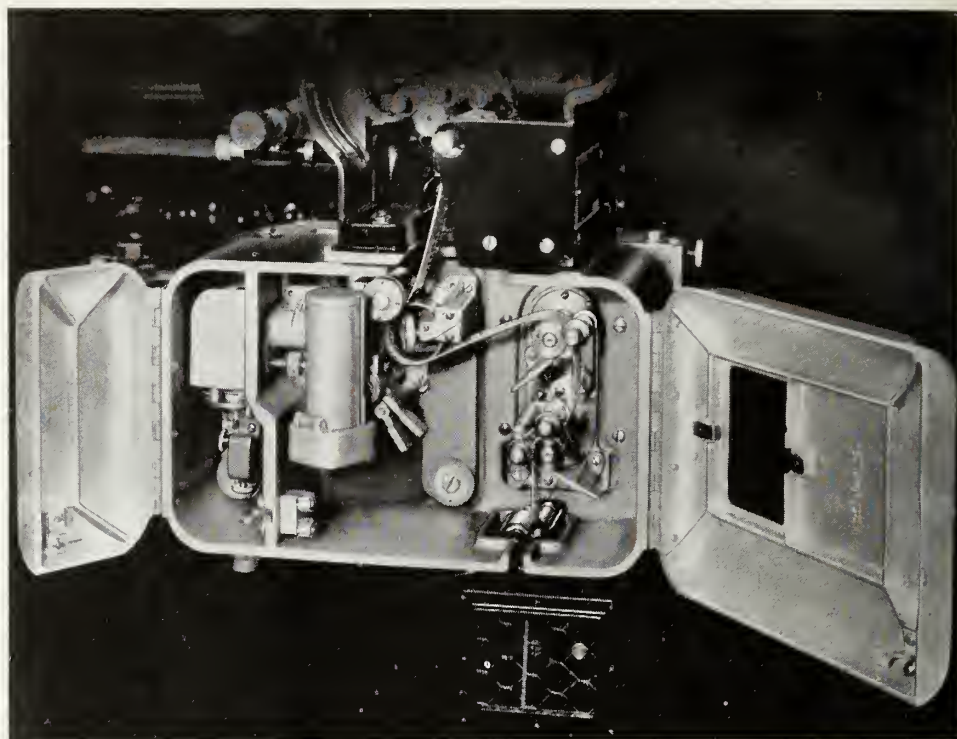
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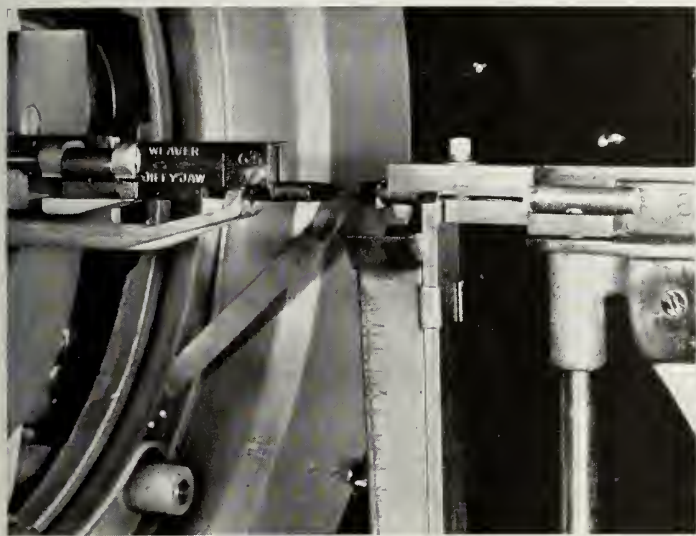
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The rotary stabilizer sound head of the Simplex sound system is illustrated at top. Note sturdy and compact construction. Simplex system will take care of modern type push-pull and the stereophonic sound of the future. The new Simplex sound is manufactured under license from both ERPI and RCA, by International Projector Corporation in conjunction with their new Model E-7 Simplex projector. The Simplex system offers one deluxe design for theatres of any size. Only variables are number of power amplifiers operating in parallel to provide proper power output and the type and number of loudspeakers to provide adequate distribution and power handling. Below are illustrated a typical horn setup (left) and the main amplifier cabinet of modern design.

Projection



NEW DEVELOPMENTS IN FIELD

The Weaver accessories; Flat Light Screen tests; the Academy report on film scratch precautions; Notes and Comment.

By Paul R. Cramer, Local 150, IATSE.

It is a real pleasure to talk about an old-timer among the projectionists who has made good in more trades than one. We refer to Brother Fred Weaver, member of Local 150, IATSE, who with Art Schroeder and Harold Greiner, is on the projection staff of the world-famous Grauman's Chinese Theatre in Hollywood (operated by Fox West Coast).

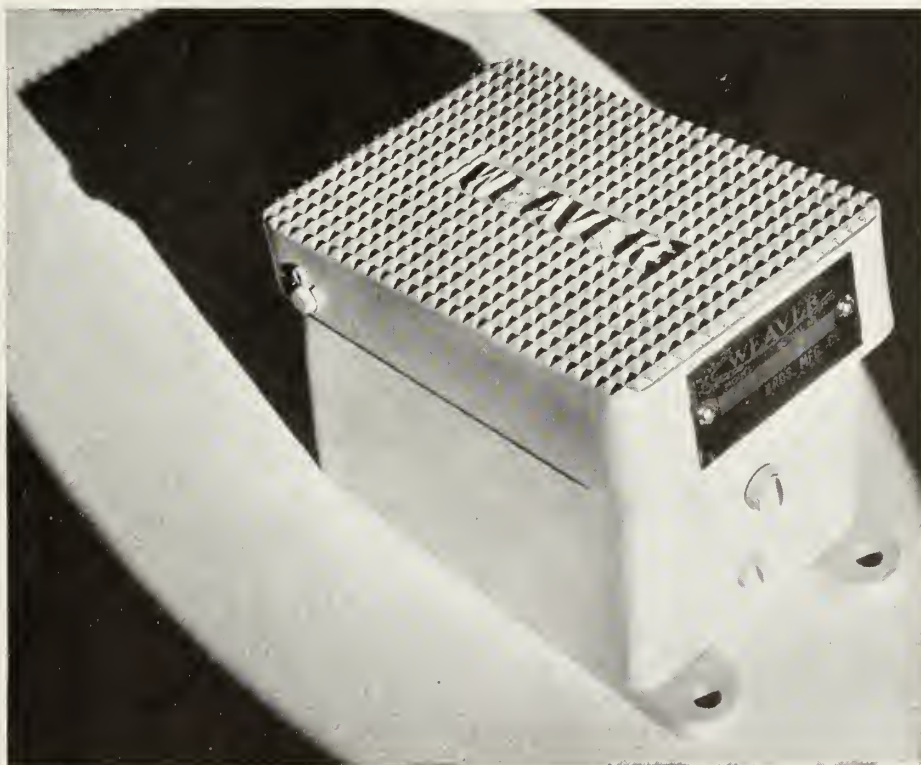
Brother Weaver promises to have the lowdown on the new Model E-7 Simplex projector, recently installed at the Chinese, ready for the next issue of INTERNATIONAL PHOTOGRAPHER, but our current discussion is confined to a group of projection room devices he has perfected that are of great value in promoting efficiency and economy in projection practice.

The illustration at top right on this page shows the Weaver Douser, with which so many of us are familiar. This piece of equipment is the result of experience and ingenuity. The original model was, naturally, rather crude compared with the present one, but during the period of trial and error, it has been perfected considerably.

This particular model of the Weaver Douser was made especially for the Model E-7 Simplex, and is a little heavier

throughout than the previous models. It comes equipped with the bracket, screws, bolts and everything necessary for ready installation.

The next illustration (top left) shows the new carbon savers for Suprex carbons



All pictures on this page are fully described in the accompanying story.

and although the ones in the picture are for a Peerless type lamp, Brother Weaver assures me that he has on hand carbon savers for practically any lamp made at the present time. Here is a word to those brothers that do have these Jiffy Jaw carbon savers now: "The tightening screw of the positive saver should not be tightened so that the carbon cannot be inserted or removed by merely pushing in the carbon butt under a reasonable pressure. As the carbon heats after striking the arc, it expands, therefore tightening in the holder. If tightened too tight with the screw the expansion will warp the saver out of shape. The Negative saver can be tightened as much as desired because the negative carbon must be held rigid at all times."

Finally, at the bottom of Page 29, is pictured one of the foot change-over switches developed by Brother Weaver. This particular piece of equipment is not used very much on the Pacific Coast, but I. A. members east of Denver seem to like them very much; at least so the sales chart shows. We would like some word from the eastern brothers as to the ability of this equipment to withstand hard use, for this department of INTERNATIONAL PHOTOGRAPHER desires to boost only the equipment that can be of permanent use to all projectionists and we welcome practical information along such lines.

Brother Weaver invites all projectionists visiting Los Angeles to drop in at his plant and see for themselves just how the above articles are made and for those who cannot come but desire further information, he would be more than pleased to have you drop him a line at 1639 East 102nd St., Los Angeles, Calif.

Screen Test Report

Much interest was evoked by our recent publication of stories about the new Flat Light Screen. The new type screen has received a great deal of unofficial approval in informal studio tests, as well as passing rigid tests by Dr. Lee De Forest, Jr., and the Electrical Testing Laboratories of 80th Street and East End Avenue, New York City. The DeForest tests were reported in the May issue and we present herewith the text of the ETL report, which is signed by C. E. How and William T. Little, the latter chief engineer of the laboratory's photometric department.

Data requested: Brightness characteristics and reflection factor of one sample of motion picture projector screen.

Authorization: Personal application of Mr. John Gentile.

Material submitted: One sample of motion picture projector screen (E.T.L. No. 20).

Test: To determine the brightness characteristics of the screen a beam of

light was thrown normally upon the screen and its brightness was observed at angles varying from 1 degree to 80 degrees to the normal.

Measurements of reflection factor were made, illuminating the sample by diffused light of equal intensity from all directions. The color temperature of the light source was approximately 2100 degrees K. The sample was viewed at an angle of 12 degrees to the normal.

Result of Test: The reflection factor of the sample is shown in Table No. 1. The per cent brightness in terms of a perfect diffuser is shown on the attached graph, Plate 30429, and in Table No. 2.

TABLE No. 2

Angle	Brightness in terms of a Perfect Diffuser having a reflection factor of 100%
1 degree	114
5 degrees	100
10 degrees	96.5
15 degrees	90
20 degrees	86
30 degrees	83.5
40 degrees	83
50 degrees	77.5
60 degrees	73.5
70 degrees	71
80 degrees	59

Story of Production

Watch for the first publication anywhere of the complete technical story of what happens to a piece of film from the time the manufacturer delivers it to a studio until it is turned over to the projectionist in release print form. This series will appear soon in INTERNATIONAL PHOTOGRAPHER. A number of studio technical experts are cooperating with us in preparing this material and we expect to present a large batch of exclusive technical news pictures and practical working charts of production activity. We hope to have this material lined up in time to start it as a series in the July issue.

MPPC Opens Plant This Month

Motion Pictures Process Corporation, new projection background and special effects organization, expects to open its new Hollywood headquarters the middle of this month. Original opening was set for May, but was put back due to delays in construction and installation at its new plant on McCadden Place.

MPPC holds a long term exclusive distribution and exploitation deal on the Neumatz rear projectors and also will offer full production facilities for process work at its new headquarters. Motion picture and still photography effects in black-and-white or color will be available, along with a complete library of backgrounds. Roy Davidson, well-known in the studios in the process field, is technician in charge.

It had been intended to publish a complete layout of the new headquarters in this issue of International Photographer, but due to the holdup on completion of the new quarters, this will appear in the July issue.

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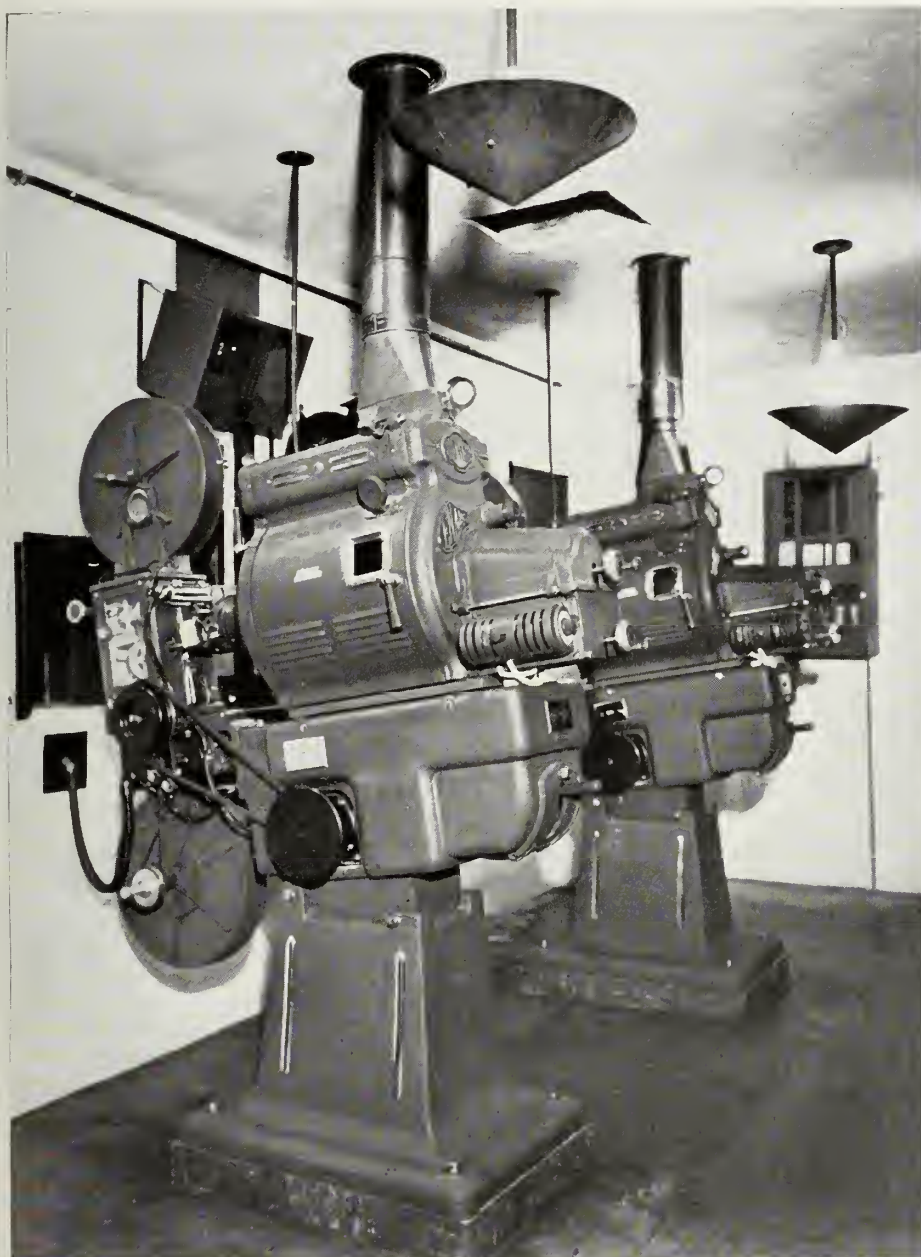
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An outstanding neat and clean projection room, that of the Variety Theatre, Medford, Oregon, featuring Motiograph projector heads and bases and Brenkert lamps. This is booth streamlining at its best.

Heat and Readings

The following excerpt from the National Carbon Company Projection Handbook is reprinted in answer to an inquiry on the subject discussed. Any "IA" brothers who do not have this valuable handbook may obtain one by writing the company. They'll be glad to send one.

"In the permanent magnet type of direct current instruments, if the temperature is increased the strength of the magnets will be decreased which tends to decrease the reading of the instruments; but at the same time the strength of the holding spring will be decreased and these two errors tend to neutralize each other. As a general rule, however, these meters will read low when they are hot. In the ammeters of this type with the in-

ternal shunt the heat from the shunt usually will cause the instrument to read low. Up to about 25 amperes these meters read correctly, but above that they should not be left in the circuit at all times. Direct current meters for reading large currents should be provided with an outside shunt.

"Errors will be caused by stray magnetic fields, the size depending upon the strength of the field. An alternating current field, if weak, will not affect a direct current meter, but if strong it will exert a de-magnetizing effect upon the meter and cause a low reading. These fields may be caused by any electric generator or motor, a conductor carrying current, or any other meters. Switchboard meters should be shielded from the effect of these fields by an iron case."

Streamlined Booth

Continuing the thought of projection room cleanliness, we present this month a picture of the Variety Theatre in Medford, Oregon, featuring Motiograph projector heads and bases and Brenkert lamps. Note the strict simplicity of the equipment. There are no wires nor unnecessary junk lying around. By junk I mean pans on the floor to catch surplus oil, exposed wire, cans for carbons and other things too numerous to mention that only the projectionist on the job would understand the reason for.

Checking Up

I walked into this one the other day, when on the 20th Century-Fox lot. Brother Harry Mahler of Locals No. 150 and 37, IATSE, stopped me and wanted to know how come I recently quoted the line voltage and amperage and not that which would be registered at the ARC. (Int. Photog., March, 1938.) Of course my only answer could be that the only meters showing at the MGM studio on the demonstration described were line meters, but when the question was put to Brother Merle Chamberlin of MGM the information was forthcoming at once. The arc voltage was 60 and actual current was 62 amperes. We were unable to check the resistance, since the studio is changing the portable equipment around and the grids used on this screen test have now been moved elsewhere, but Brother Chamberlin is going to make a similar test this month, and we'll have all the information in the next issue.

Reducing Print Scratches

From the Academy Research Council comes a report of May 7th date, covering modifications in projection equipment aimed to reduce print scratches. Because this should interest every projectionist, the full text of the report follows:

The following information summarizes modifications made in projection and other equipment to prevent rotating parts from scratching prints, and has been furnished by Major Nathan Levinson, Director of Sound Recording for Warner Brothers - First National Studios, for the information of the engineering departments of the producing companies participating in the Research Council's cooperative technical program, and the engineering departments of the associated companies affiliated with these producing companies.

A. Projector Picture Heads

- 1—Intermittent and upper and lower sprockets relieved to the tooth base on the insides of each sprocket.



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- 2—All pad rollers and idler rollers are relieved where required. Those which have double flanges have had the inside flanges turned down flush with the center diameter of the roller.
- 3—In all instances, sprockets and rollers are relieved on each inside edge to permit of their being reversed to secure longer life after tooth and flange wear.
- 4—A flanged guide roller is installed above and to the left of the fire-trap in the upper magazine. The film passes under this roller as it leaves the reel and is guided through the fire-trap rollers to prevent those rollers from scratching the film due to excessive weave caused by bent reels, spindles, etc.
- 5—The lower small roller in the fire-trap of the takeup magazine has been replaced by a flanged guide roller to prevent the film weaving through this fire-trap because of bent takeup reels, spindles, etc. To allow threading through the fire-trap with this roller installed, the fire-trap casting is cut away on the front side so as to greatly widen the present threading slot.

B. RCA Preview Attachments

- 1—All guide rollers are relieved.

C. RCA Sound Heads

- 1—Constant-speed and hold-back sprockets are relieved.
- 2—All pad rollers are relieved.

D. RCA Dummy Heads

- 1—See RCA Sound Heads.

E. RCA Film Phonographs

- 1—Thirty-two tooth sprockets relieved.
- 2—All pad rollers and idler rollers relieved in the phonograph and in the double magazine.

F. Moviolas

- 1—Sound head.
 - (a) Pull down and sound sprockets relieved.
 - (b) Pad rollers and idler rollers relieved.
 - (c) Felt shoes in sound gate should be of the latest type which bear only outside the sound track area.
 - (d) Sound sprocket shoe must not be so worn that its two mounting screws or inside surface bears on the film.
- 2 Picture machine.
 - (a) Not modified except in film laboratory where composite film is run in moviolas. All sprockets and rollers are relieved.

G. Eastman Visible Numbering Machines

- 1—Drive sprocket relieved.
- 2—All pad rollers and idler rollers relieved.

H. Footage Counters

- 1—Drive sprockets relieved.
- 2—All pad rollers relieved.

20th Century-Fox Studios have altered all equipment by exactly similar methods to those used by Warner Brothers in every case, except that, instead of placing a roller in the lower magazine fire-trap, a flange roller has been placed just outside the fire-trap which acts as a guide for the film and leaves the fire-trap as originally constructed.

Lighting-Sets



Transparency of Lucite, amazing new DuPont resin plastic, is illustrated in top view of girl photographed through a 9½-inch thickness. Top right shows adaptability to designs for studio props and below a view of the Michigan highway between Detroit and Lansing where new material is used for reflectors along roadside. Lucite can be fabricated into tints and shades by combining dyes and pigments, and also to varying degrees of transparency.

DuPont's Lucite

New resin product, light, tough and transparent, attracts much interest for studio use.

A water-clear plastic, strong as glass, flexible and non-shattering, Lucite, new resin product from DuPont, is attracting considerable interest for use in studio props and offers many possibilities for its application in the motion picture industry. Chemically known as methyl methacrylate polymer, Lucite is half as heavy as common glass, is clearer than optical glass, and is strong enough to resist a tension of 4 to 5½ tons a square inch.

Though softer than glass it is hard enough to be used for many purposes. It is thermo-plastic and can be sawed, cut, drilled and polished, also molded to any desired form; and a liquid intermediate variety can be poured into molds and hardened. Unlike glass, Lucite transmits a large proportion of the sun's ultra-violet rays. It is not affected by sunlight.

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Patents

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,115,153—OPTICAL SYSTEM. *Merrill W'aide*, New York, N. Y., assignor, by mesne assignments, to Opticolor, Inc., New York, N. Y., a corporation of New York. Original application March 1, 1930, Serial No. 432,325. Divided and this application Aug. 20, 1934, Serial No. 740,588. 4 Claims. (Cl. 88-1)

An optical system for color cameras and projectors for additive color systems which includes a combination of lenses to divide the light into two parallel rays without a light splitting mirror.

No. 2,115,339—PHOTOGRAPHIC PLATE. *Ralph Bryant Mason*, New Kensington, Pa., assignor to Aluminum Co. of America, Pittsburgh, Pa., a corporation of Pa., application Oct. 27, 1932, Serial No. 639,851. 8 Claims. (Cl. 95-8)

An aluminum photographic plate comprising an aluminum surface provided with a coating consisting substantially of aluminum oxide in combination with a photo-sensitive salt.

No. 2,115,394—PHOTOGRAPHIC COLOR-FORMING COMPOUNDS. *Leopold D. Minnev, Leopold Godowsky, Jr., and Willard D. Peterson*, Rochester, N. Y., assignors to Eastman Kodak Co., Rochester, N. Y., a corporation of New Jersey. No drawing. Application Oct. 14, 1936, Serial No. 105,617. 12 Claims. (Cl. 95-88)

A color-forming photographic developer comprising an aromatic amino developing compound containing a primary amino group and a coupler compound having the formula R-CO-CH₂-CN, where R is selected from the class consisting of acenaphthenyl, dibenzofuryl, coumaronyl, and phenoxyphenyl groups.

No. 2,115,738—FILM FEEDING MECHANISM. *William J. Morrissey*, Brooklyn, N. Y. Original application June 3, 1933, Serial No. 674,127. Divided and this application March 28, 1934, Serial No. 717,785. 6 Claims. (Cl. 271-2.3)

Feeding means comprising a drum-like film supporting member and a circular rotating member correlated therewith so that tooth ripple is damped out.

No. 2,115,886—COLOR PHOTOGRAPHY. *Chalmers C. Smith*, Glendale, and *Ray H. Pinker*, Los Angeles, Calif. Application Jan. 8, 1936, Serial No. 58,108. 6 Claims. (Cl. 95-2)

Means for recording colored objects comprising a mosaic screen of mixed blood corpuscles dyed in differing colors, and a light sensitive material positioned to receive light passing through said screen.

No. 2,116,826—PROCESS OF MAKING COMPOSITE PICTURES. *William Vernon Draper and Frank William Young*, Palms, Calif., assignors to one-third to Charles L. Stokes, Los Angeles, Calif. Application July 2, 1934, Serial No. 733,470. 10 Claims. (Cl. 88-16)

A process which comprises producing an image on part of the emulsion and fogging the balance thereof, developing, fixing, and resensitizing the emulsion, re-exposing the image alone, and then printing a different image on the rest of the film and developing and fixing.

No. REISSUE 20,678—APPARATUS FOR MAKING COLOR MOTION PICTURES AND CAMERAS THEREFOR. *Otto C. Gilmore*, Los Angeles, California, assignor, by means of mesne assignments, to Cinemacolor Corporation, Chicago, Ill., a corporation of Delaware. Original No. 1,978,789, dated Oct. 30, 1934, Serial No. 316,902, Nov. 3, 1928. Application for reissue Aug. 17, 1936, Serial No. 96,531. 2 Claims. (Cl. 88-1)

A prism assembly for converting an ordinary camera into a beam-splitting color camera.

No. 2,112,226—TRIPACK. *Walter Dewey Baldsiefen*, Raritan Township, Middlesex County, and *John Ran Weber*, South River, N. J., assignors to Du Pont Film Manufacturing Corp., New York, N. Y., a corporation of Delaware. Application Oct. 24, 1936, Serial No. 107,484. 2 Claims. (Cl. 95-2)

A tripack negative for color photography comprising a yellow dyed blue sensitive film, a red dyed green sensitive film, and a red sensitive film with a greenish blue anti-halation layer.

No. 2,112,894—FILM MOTION FILTER. *Harold J. Hasbrouck, Jr.*, Merchantville, N. J., assignor to United Research Corporation, Burbank, California, a corporation of Delaware. Application March 28, 1936, Serial No. 71,532. 13 Claims. (Cl. 271-2.3)

A stabilizer for film advancing means comprising a sliding friction damper located in a loop of said film offering substantially constant counterforce over a certain range of velocities.

No. 2,113,182—CINEMATOGRAPH APPARATUS. *Gordon Brown Scheibell*, Millburn, N. J. Application April 18, 1935, Serial No. 16,955. In Canada Nov. 20, 1931. 7 Claims. (Cl. 88-17)

A manually settable automatic mechanism for controlling the effective operation of a rotary film driving means.

No. 2,113,184—METHOD OF RECORDING AND REPRODUCING SOUND ON FILM. *George Sperti*, Covington, Ky. Application Nov. 23, 1934, Serial No. 754,505. 5 Claims. (Cl. 179-100.3)

Reproducing apparatus having an optical wedge adjacent to the film and means for moving the wedge in accordance with lateral movements of film.

No. 2,113,193—LIGHT SENSITIVE LAYER AND METHOD OF MAKING SAME. *Jan Hendrik de Boer*, Eindhoven, Netherlands, assignor to N. V. Philips' Gloeilampenfabrieken, Eindhoven, Netherlands. No drawing. Application Dec. 26, 1934, Serial No. 759,315. In Germany Oct. 10, 1934. 8 Claims. (Cl. 95-6)

A film for color photography having in its emulsion a diazonium compound, a coloring component capable of reacting with said diazonium compound to form a colored image when moistened and a powdered substance to absorb moisture from the atmosphere.

No. 2,113,256—FILM DRIVING MECHANISM. *Armand L. Jeanne*, Garden City, N. Y., as-



"THE BEST LAID PLANS OF MICE AND MEN"—so goes an old adage and never was it better proved than during the recent lunar eclipse. Dr. Dinsmore Alter, Director of the Observatory, and Leon Hall, Observatory Technician, of the Griffith Park Observatory, extended their full cooperation to Al Brick, Movietone News cameraman, to photograph the eclipse. If you read the newspapers you know the answer. It was Friday the 13th and old man fog, just to support the popular superstition, rolled in with the well-known pea soup variety and spoiled everything. However, it was a good try and an interesting experiment which would have given newsreel audiences a front row seat at the eclipse. The long tube at the upper right received the image from ceostat mirrors and projected it onto an aluminized mirror from which it was to be photographed in stop motion. The picture, by Warren McGrath, Movietone soundman, and a member of Local 695, IATSE, gives an interesting view of the photographic set-up for such work.

signor to Bell Telephone Laboratories, Inc., New York, N. Y., a corporation of N. Y. Application Feb. 18, 1937, Serial No. 126,427. 6 Claims. (Cl. 271-2.3)

A film driven fly-wheel and a freely rotatable fly-wheel and two film driving mechanisms, one of which cuts out above a certain fly-wheel speed.

No. 2,113,312—FINE GRAIN PHOTOGRAPHIC DEVELOPER. *Paul W. Vittum*, Rochester, N. Y., assignor, by mesne assignments to Eastman Kodak Company, Jersey City, N. J., a corporation of N. J. No drawing. Application Nov. 2, 1935, Serial No. 48,049.

4 Claims. (Cl. 95-88)

A fine-grain photographic developer comprising a developing agent and a strong acid salt of ethylenediamine.

No. 2,113,329—COLOR PHOTOGRAPHY. *Leopold D. Mannes and Leopold Godowsky, Jr.*, Rochester, N. Y., assignors, by mesne assignments, to Eastman Kodak Co., Jersey City, N. J., a corporation of N. J. Application Feb. 27, 1935, Serial No. 8,516. 18 Claims. (Cl. 95-2)

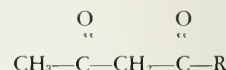
The process of producing a colored photographic record on a sensitive element having a plurality of superposed, differently sensi-

tized silver halide layers, which comprises simultaneously forming latent images in the layers, the images being different color sensation records of a subject, simultaneously developing the latent images to metallic silver images, bleaching the images to remove the silver, exposing the sensitive element to light, re-developing the images in a color-forming developer, selectively bleaching at least the outer layer and re-developing said last-mentioned layer in a second color-forming developer.

The process of producing a sound track on a sensitive element having a plurality of superposed, differently sensitized, silver halide layers which comprises forming a latent image of the sound track on the sound track portion of the film, developing said latent image to metallic silver and dye images in a color-forming developer, coating the sound track portion of the film with a material impervious to subsequent treatment baths, and processing the film to produce color component images in the remaining portions of the film.

No. 2,113,330—COLOR-FORMING DEVELOPERS. *Leopold D. Mannes and Leopold Godowsky, Jr.*, Rochester, N. Y., assignors, by mesne assignments, to Eastman Kodak Co., Jersey City, N. J., a corporation of New Jersey. No drawing. Application Feb. 27, 1935, Serial No. 8,519. 4 Claims. (Cl. 95-88)

A color-forming photographic developer comprising an aromatic amino developing compound and a coupler compound have the formula



where R is a group selected from the group consisting of alkyl and aryl groups.

No. 2,113,400—RECORDING AND REPRODUCING APPARATUS. *Glenn L. Dimmick*, Had-donfield, N. J., assignor, by mesne assignments, to Radio Corp. of America, New York, N. Y., a corporation of Delaware. Application Oct. 31, 1934, Serial No. 750,766. 6 Claims. (Cl. 179-100.3)

A recording apparatus provided with means for moving a portion of the lens system in correspondence with variations in the film movement.

No. 2,113,476—METHOD OF COPYING GOFFERED FILMS. *Anne Henri Jacques de Lassus Saint Genies*, Versailles, France. Application June 15, 1935, Serial No. 26,863. In France June 19, 1934. 4 Claims. (Cl. 88-24)

A printer of goffered films including a plurality of narrow light sources and a movable screen having a narrow window and means for moving said screen homothetically with said sources of light.

No. 2,113,703—PROJECTION SCREEN. *Rafael Mendoza*, Mexico, D. F., Mexico. Application April 21, 1936, Serial No. 75,631. In Mexico August 21, 1934. 3 Claims. (Cl. 88-24)

A projection screen having a curved mirror behind it to reflect a virtual image back on the screen to give pseudo-stereoscopic effect.

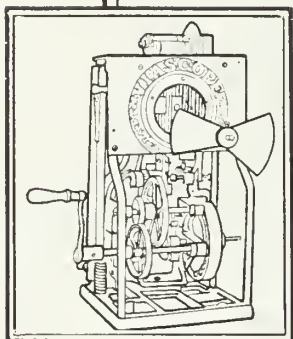
No. 2,114,187—PHOTOGRAPHIC STRIP. *Albert S. Howell*, Chicago, Ill., assignor to The Bell & Howell Co., Chicago, Ill., a corporation of Illinois. Application Nov. 28, 1934, Serial No. 755,196. 2 Claims. (Cl. 95-9)

A photographic film strip having the main longitudinal portion thereof flat and provided with a longitudinally corrugated portion of relatively short longitudinal extent disposed in the region of one end thereof and having the corresponding end thereof flat.

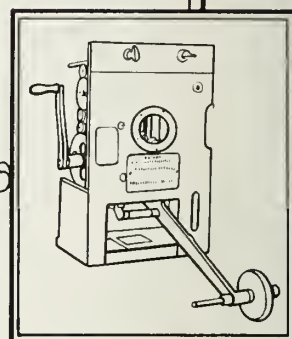
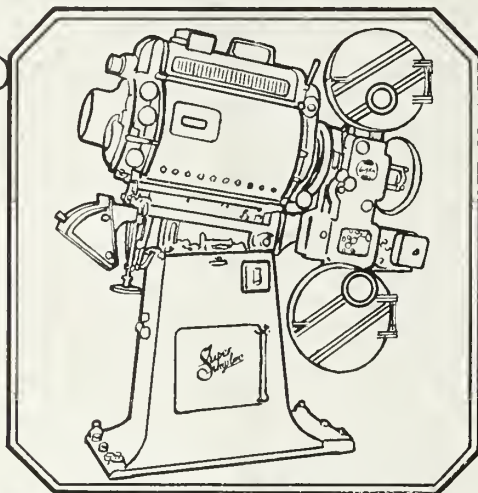
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J. E. BRULATOUR, INC.

1938



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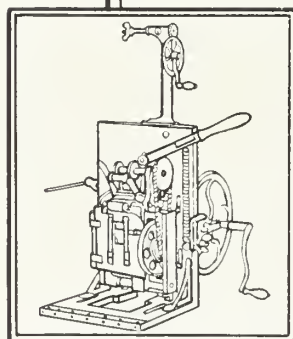
EDISON

Simplex E-7
TRADE MARK REG'D.
MECHANISM

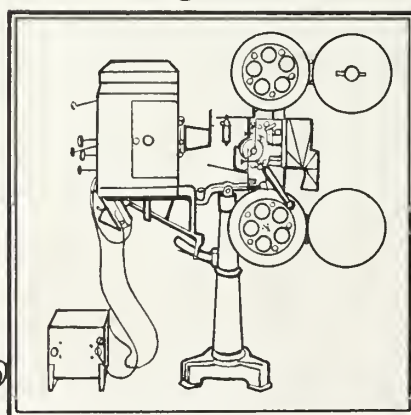
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of the long line of SIMPLEX PRODUCTS
which have given us leadership in this field
since the pioneer days of the motion picture
industry.

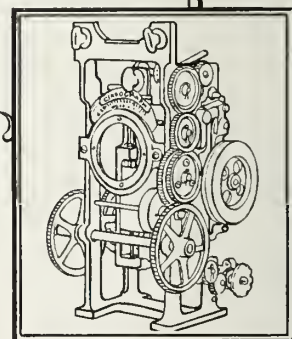
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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS



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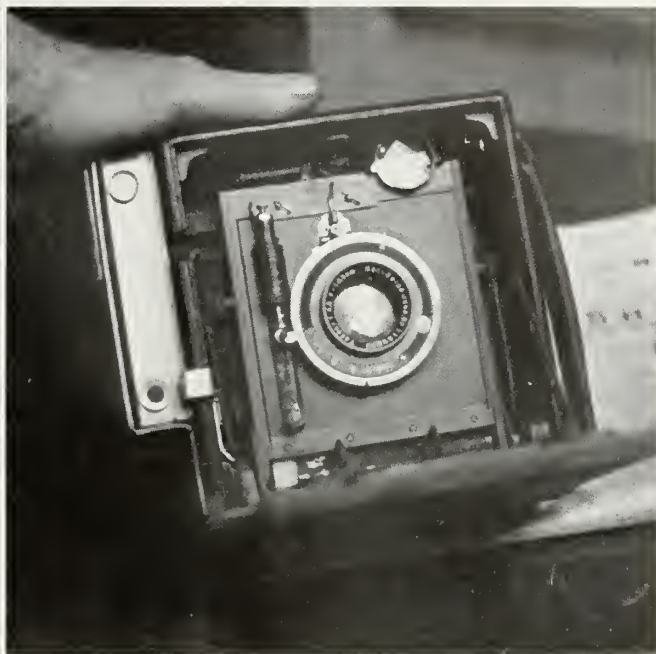
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TRADEWINDS



These shots of the Watson automatic focuser device using a reflected light beam illustrate the speed of Agfa's new Supreme. They were made with the Nettax shown on next page with medium yellow filter in late afternoon interior. Ordinary desk lamp was only extra illumination, shot at $f:2.8$ at $1/50$ second.

Watson's Candid Focuser

An outstanding addition to speed graphic photography, according to Los Angeles photographers who have used it, is an automatic reflected light beam focuser developed by Coy Watson, Jr., of the photographic staff of the Los Angeles Herald-Express, afternoon newspaper. It proved so practical that Jack Campbell, managing editor, and Frank Bentley, head of the paper's photographic department, have had all staff press cameras equipped with the device. Other newspapermen also have requested the attachments to the extent that Watson now is considering turning them out in larger quantities.

As illustrated on this page, the focuser can be built into the camera and in no way interferes with normal operation. Whenever photographic light present is not so brightly glaring as to kill out the reflected light of the focuser device, it insures absolutely accurate focusing and framing merely by racking the lens, and permits speed graphic photography to equal so-called candid photography with the advantages of the larger negative.

Watson's focuser is based on the principle of light being reflected from a mirror on a 45-degree angle. In other words, an indirect light beam is used for focusing the camera and simultaneously framing the image correctly. Light for the focuser originates from a small flashlight bulb, which is mounted at the top of the camera box. The beam used is the reflected image of the actual burning wire in the bulb. This light from the glowing wire moves across the back of the camera and strikes a small mirror, which is at a 45-degree angle. The reflector mirror throws the light out towards the front of the camera and parallel to the lens in the same direction the picture is to be taken. Fastened to the front-board, and exactly even with the photographic lens is an auxiliary lens. This is used to control the light beam, which passes

through the lens and is thrown out into space. In actual practice a small dot of light, about the size of a half-dollar, is seen by the photographer on the object to be photographed. Through the center of this dot of light the "S" shape of the glowing wire of the single bulb filament is plainly visible.

When the lens-board is racked forward until the "S" comes into sharp focus, the picture automatically is correctly focused and framed, *because the distance from the wire in the bulb to the mirror and thence to the auxiliary lens is mathematically identical with the distance from the photographic lens to the ground glass.* Accurate and speedy focusing with this method is possible within a range of from three feet to approximately 25 feet, the longer distance depending upon light conditions.

A distinctive feature is that the accessory device in no way interferes with routine operation of the camera. Once it is properly attached, there is nothing to adjust or unscrew in opening or closing the camera.

The batteries used are small and compact and are easily and conveniently replaced in a holder under the camera. The device uses two batteries, the standard one-cell pen flashlight type, No. 915, Size AA. These are widely available. Experience in newspaper use is that the batteries last for about two weeks.

Watson's invention already is in use to the extent of about two dozen units, and plans for additional production to make it available on a wider scale at a reasonable cost now are in the discussion stage. Anyone interested may communicate with the inventor in care of this publication or the Herald-Express, Los Angeles.

Watson is a nephew of George Watson, Los Angeles chief for Acme-NEA Service, whose interesting historical collection on wire picture transmission was the subject of a story in the December, 1937, INTERNATIONAL PHOTOGRAPHER.

Zeiss' Nettax

While not as widely exploited as the Contax, one of the most interesting miniature cameras in the Zeiss line is the Nettax, which uses standard 35 mm. motion picture film and sells from \$120 to \$165, depending on type of lens used as standard equipment. The camera incorporates many of the Contax features. It has a metal focal plane shutter. Lenses are easily interchangeable.

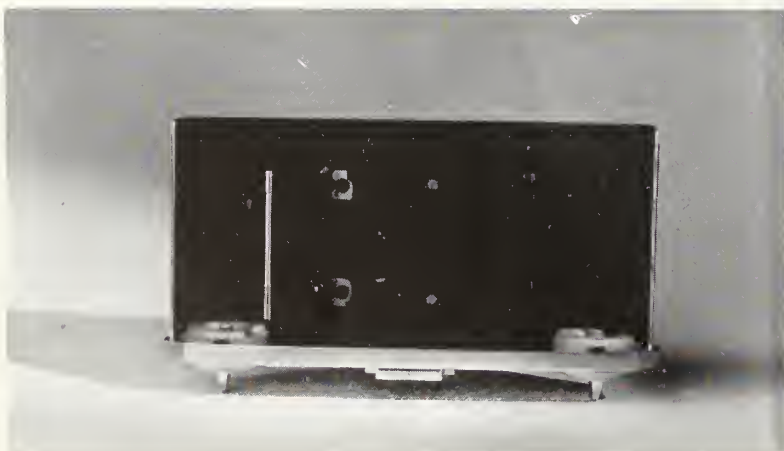
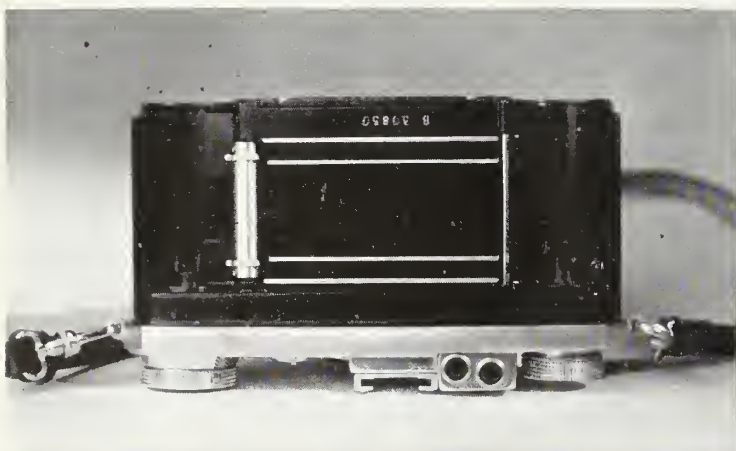
As illustrated on Page 2 in a virtually self-explanatory layout of pictures, photographed exclusively for INTERNATIONAL PHOTOGRAPHER by Paul Allen, it will be noted that the demountable lens has a built-in superimposed image-type range-finder. Also the range-finder and viewfinder eye-pieces are placed close together for convenient and rapid operation.

The back is completely removable and loading can be accomplished either with Contax metal magazines or most of the standard spools supplied by the film manufacturers. Shoes on top of the camera are designed to accommodate extra finders, the Contameter and other accessories. The automatic film transport prevents double exposure. There is an automatic picture counter. Speeds are from $1/5$ to $1/1000$ second and bulb. Trigger release is in the center of the winding knob at top left of camera when viewed from front. Speeds are set by lifting the winding knob and setting it at indicated marks.

The Nettax is cased in a rigid metal housing, covered with black grain leather, with all exposed metal parts chromium plated.

Photorecord Filing System

For years, business offices, industrial firms, libraries, historical associations, museums and similar institutions have been troubled with the problem of how to preserve in economical, space-saving form, their records, correspondence, valuable papers, manuscripts, books and the like. In microphotography several years ago was found the answer to the problem. Now Photorecord, a new Folmer Graflex Corporation machine, places this service within the reach of anyone



These pictures of the Zeiss Nettax (Page 1, Column 1) were photographed exclusively for International Photographer by Paul Allen, who also photographed the Hyp-O-meter shown on Page 5. The Nettax pictures are virtually self-explanatory. Shown with the

camera are Zeiss sunshade filter holder and the standard Contax spool with its bakelite case. Note close position of view-finder and range-finder eye pieces. Next month, dope on the new single lens reflex camera models.

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

Editor, ED GIBBONS; Managing Editor, HERBERT ALLER; Art Editor, JOHN CORYDON HILL;
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J. N. A. HAWKINS, PAUL R. CRAMER, WILLIAM COMYNS.

VOL. X.

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ON THE COVER. A striking silhouette shot by Durward "Bud" Graybill (659, IATSE) whose hobby of silhouette photography, illustrated by a two-page layout, is described by Herbert Aller, starting on Page 11.

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Protizing—*Solow*

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SMPE Theatre Survey Report

CLASSIFIED DIRECTORY 28

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International Photographer, as the monthly official publication of International Photographers, Local 659, of the International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, not only represents the entire personnel of photographers engaged in professional production of motion pictures in the United States and Canada, but also serves technicians in the studios and theatres, who are members of the International Alliance, as well as executives and creative artists of the production community and executives and engineers of the manufacturing organizations serving the motion picture industry. International Photographer assumes no responsibility for the return of unsolicited manuscripts or material.

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Left, the new Photorecord filing system from Folmer-Graflex Co., which copies flat surfaces up to newspaper size on 35 mm. film. (Page 1, Column 3) and Right, the new Bell & Howell 8 mm. Titler, shown in operation with a Filmio 8. (Page 4, Column 2.)



desiring it, due to its low cost and economical operation.

The new instrument, illustrated on Page 6, enables as many as 800 newspaper pages or 1600 smaller pages to be recorded on one 100-ft. roll of 35 mm. film four inches in diameter and two inches thick. The reduction in storage space is as much as 95 per cent and the acetate film used will last as long as record paper of the highest quality.

Duplication is made easy with the Photorecord. Once the desired material is recorded on film, it is a comparatively simple matter to make positive film copies of the original negative or enlarged prints of any size.

The Photorecord is a compact, completely portable camera apparatus weighing only 42 pounds when packed. In it is combined everything necessary to photograph anything occupying a relatively flat plane up to and including a full newspaper page.

Actual operation of the unit is effected by a foot pedal which enables the hands to be left free to handle the subject being photographed. Each time the pedal is pressed down, the film is positioned, the lights are turned on from half to full photoflood intensity and the shutter is actuated. Speeds of from 500 to 1000 exposures per hour may be made. A counter is an integral part of the machine.

Complete portability of the equipment makes it ideal for use in various locations. The outfit when packed in its carrying case weighs only 42 pounds, and may be carried as easily as a suitcase. Thus the operator can take the camera wherever he goes and obtain exact photographic copies of the material he desires.

Filmio 8mm. Titler

Owners of Bell & Howell Filmio 8 mm. cameras now can obtain a new titler designed especially for Filmio 8's.

The new B&H device, shown on Page 6, consists of a base and camera stand cast of aluminum in one piece, and an illumination arm which fastens securely to the camera support and bears two mazda lamps. At the upper end of the camera stand is a special, highly-corrected copying lens in the Filmio snap-on-mount, to which camera is fastened in the usual way after the regular photographic lens has been removed. The titler lens is accurate pre-focused on the title card holder on the base, directly beneath the camera.

The holder takes title cards $3\frac{1}{4}$ inches by $2\frac{9}{16}$ inches. This size was selected as best for reproducing typewritten titles so that they appear entirely legible on the screen.

The illumination arm fits firmly in its socket on the camera stand, and the two lamps and reflectors are permanently fixed in the exact position which eliminates glare from surface of the title card. It is even possible to use a glossy finished photograph as a background, without recording highlights in the title. Two sets of lamps are furnished, providing correct illumination for films of various emulsion speeds.

Since the newer Filmio 8's are all equipped with the single exposure device, the titler can also be described as a most efficient miniature animation stand. Animated maps, drawings, cartoons, etc., are all easily made. It can be used in a horizontal position, with the camera resting on its own base, and since the titler lens has

depth of field of more than one inch, objects of considerable depth may be photographed in sharp focus.

The Hyp-O-meter

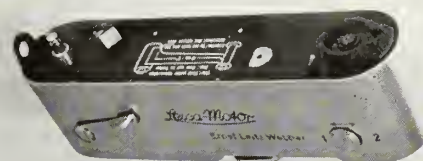
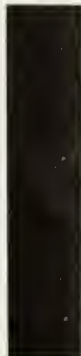
Claimed to eliminate all guess-work in washing of prints and film negative in the still photography lab, the Hyp-O-meter, manufactured by Haynes Products Co., of 136 Liberty Street, New York City, is attracting considerable interest amongst professional lab workers. The makers contend that when properly used it will allow washing to be finished in the shortest possible time without risking incomplete washing.

As illustrated on Page 5, the Hyp-O-meter is a handy and compact instrument. It can be set upright on the table or hung on the wall by means of a small eye. A flexible cable is provided, to one end of which the contact electrode is connected, while at the other end are two pin-jack terminals. In operation these pins are inserted in the bottom of the meter.

The adjustable knob below the meter is for battery compensation. It needs only occasional adjustment after it is once set. Two small 3-volt flashlight batteries are used, which are easily and conveniently replaced. In ordinary use they last more than a year.

Before using the instrument for hypo tests, the tap water used must be tested; and this establishes a reference point of zero. The Hyp-O-meter actually measures the relative resistance of any fluid in which the electrodes are submerged. Hence, a reading obtained in one water will vary from that of another depending upon the fluid's chemical composition.

In testing for presence of hypo, a few prints are allowed to drip into a small graduate glass or tube, such as an M-Q developer or test tube. The electrode is inserted to the black insulated



Top strip shows the Hyp-O-meter, which insures speedy washing of prints and negatives without risking incomplete washing. (Page 4, Column 3). Center left, Patrick Nardell's new device for immediate shift from long-shots to close-ups shown built on an Akeley. (Page 5, Column 2). Center right, the new Leica rapid winder attachment, which was described in last month's Tradewinds. Bottom strip, the new Leica continuous projector for slides in display advertising. (Page 7, Column 1).

ection and the meter reading is noted. Washings are considered complete when the reading is not more than $1\frac{1}{2}$ divisions of the reference point.

The Hyp-O-meter can be used for checking other solutions and liquids with proper adjustments and planning. It sells for \$5.

Rapid Change Device

A new device for facilitating close-up and long-shot rapid changes in motion picture photography is announced by Patrick Nardell of New York City. While this device has not yet been seen on the West Coast, the inventor claims it per-

mits the use of long and short focus lenses with virtually immediate selectivity for change, allowing slow or fast dissolves and various angles of slow and fast wipes from long-shot to close-up or vice versa.

As illustrated on Page 5, Nardell's device is adapted to an Akeley silent camera, with separate finder lens of corresponding focal length, adjusted to move in unison with the dissolve mechanism, and providing a finder image of the exact photographic field.

The illustration shows an Akeley with two-inch and six-inch lens and corresponding finder lens. Any lens of different focal length can be mounted with aligned corresponding finder lens. The inventor claims his device is par-

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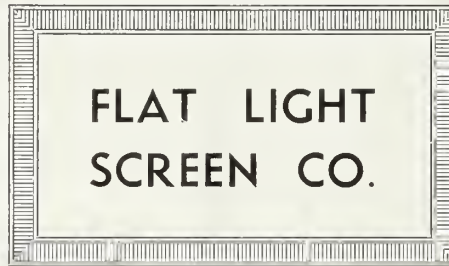
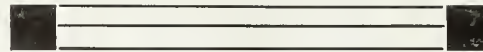
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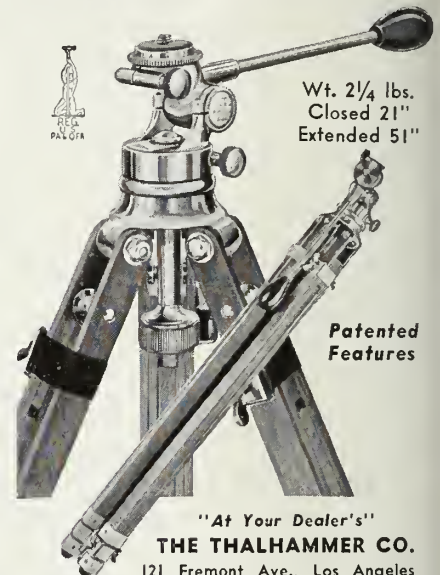
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enter upon a particular part where action has moved.

The model illustrated was built and installed by the National Cine Laboratory of New York City.

Continuous Projector

For visual advertising a new Leitz Automatic Continuous Projector now is available. It permits twelve slides to be shown over and over again, in consecutive order, for intervals ranging from 10 second to a minute. Either standard front-projection or rear-projection on a translucent screen may be employed.

The projector, shown on Page 5, accommodates the popular 2x2 inch square glass slides, either black and white or color. In the case of the latter the slides consists of 1x1½ inch color transparencies, such as are made with the Leica camera, mounted between two two-inch square glass plates.

Essential feature of the Leitz Projector is a revolving circular disc with 12 2x2 inch slots, equally spaced around its outer edge, which hold the slides. An AC-DC motor mounted on the baseboard of the continuous projector causes the disc to revolve at set intervals, which are governed by adjustment of the rheostat.

Basically, the new setup consists of two separate units—a Leitz VIII-S projector and the Continuous Projector Attachment. The projector is merely placed on the latter and the disc of the Continuous Projector Attachment revolves in such manner that the slides automatically come into the correct position for projection.

The New Filmo

Incorporating a number of new features Bell & Howell's new Filmo 141, a 16 mm. magazine-

loading amateur camera of unique design, was introduced first of this month. Features not usually found in cameras of this type, but incorporated in the new Filmo, include a radically new "projected area" viewfinder, four camera speeds, and a single frame exposure device opening up the field of animation work.

Operation of the Filmo 141 is exceptionally simple. Slip the ready-loaded film magazine into the camera, close the door, and you are ready to shoot black-and-white or color film. The advanced amateur can make use of the various speeds, single frame exposures, interchangeable lenses, critical focuser, etc., for the more versatile effects he has learned to achieve.

Most radical departure from previous design is the "projected area" viewfinder, a positive type of viewer which, it is claimed, brings to the amateur movie maker for the first time the same ease and accuracy in determining his field that the Hollywood cameraman has long used on professional cameras.

The new Filmo takes Eastman film magazines, each of which is provided with its own individual footage indicator, the dial being plainly visible through a window in the camera. The magazine is slipped into the camera through a small door at the rear, and as an added safeguard, the mechanism will not work until the door is properly closed. As the magazine is withdrawn, its aperture is covered automatically, preventing fogged film. The position of the camera door at the rear permits magazines to be changed, and a soon-to-be-announced critical focuser to be used, without removing the camera from a tripod.

A color-corrected one-inch f:2.7 Cooke lens is standard equipment; and since the camera has the same lens mount as the Filmo 70, all lenses used on the latter are interchangeable with the 141.

The mechanism is controlled by a governor which maintains a constant rate of film movement, thus insuring even exposure throughout the entire film run. Shutter is of the rotary type, giving uniform exposure over entire frame area, and its open segment of 133 degrees gives an exposure of 1/43 second at 16 frames per second.

The new Filmo will be available in two models, differing only in operating speeds. The 141-A will have speeds of 8, 16, 24 and 32 frames per second, while the 141-B operates at 16, 32, 48 and 64 f.p.s.

Wright Joins B & H

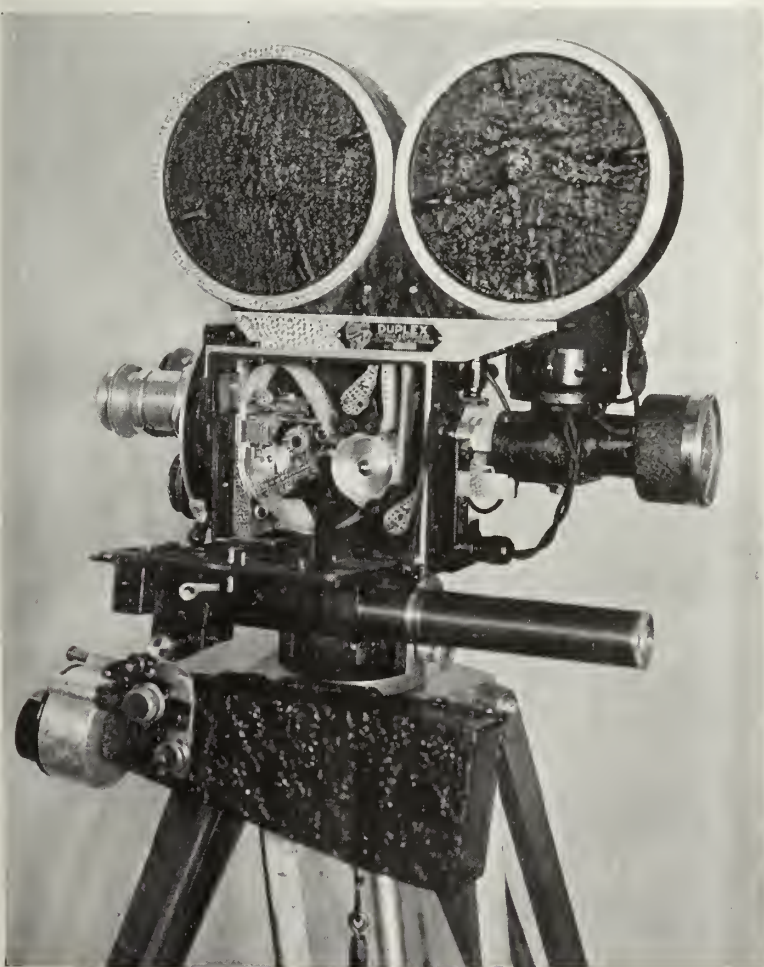
Bell & Howell Company, last month announced the appointment of A. E. Wright as manager of sales promotion and publicity. Wright has been active in Chicago advertising agency and radio circles the past 19 years. Agencies he has served as contact and copy executive include Lord & Thomas, Erwin Wasey & Co., Henri, Hurst & McDonald, Potts-Turnbull Co. and Reincke, Ellis, Younggreen & Finn. Following a year with the Columbia Broadcasting System as inter-zone sales representative prior to the establishment of their Detroit office, Mr. Wright served two years as Radio Director for Freitag Advertising Agency, directing all programs of the Pure Oil Company.

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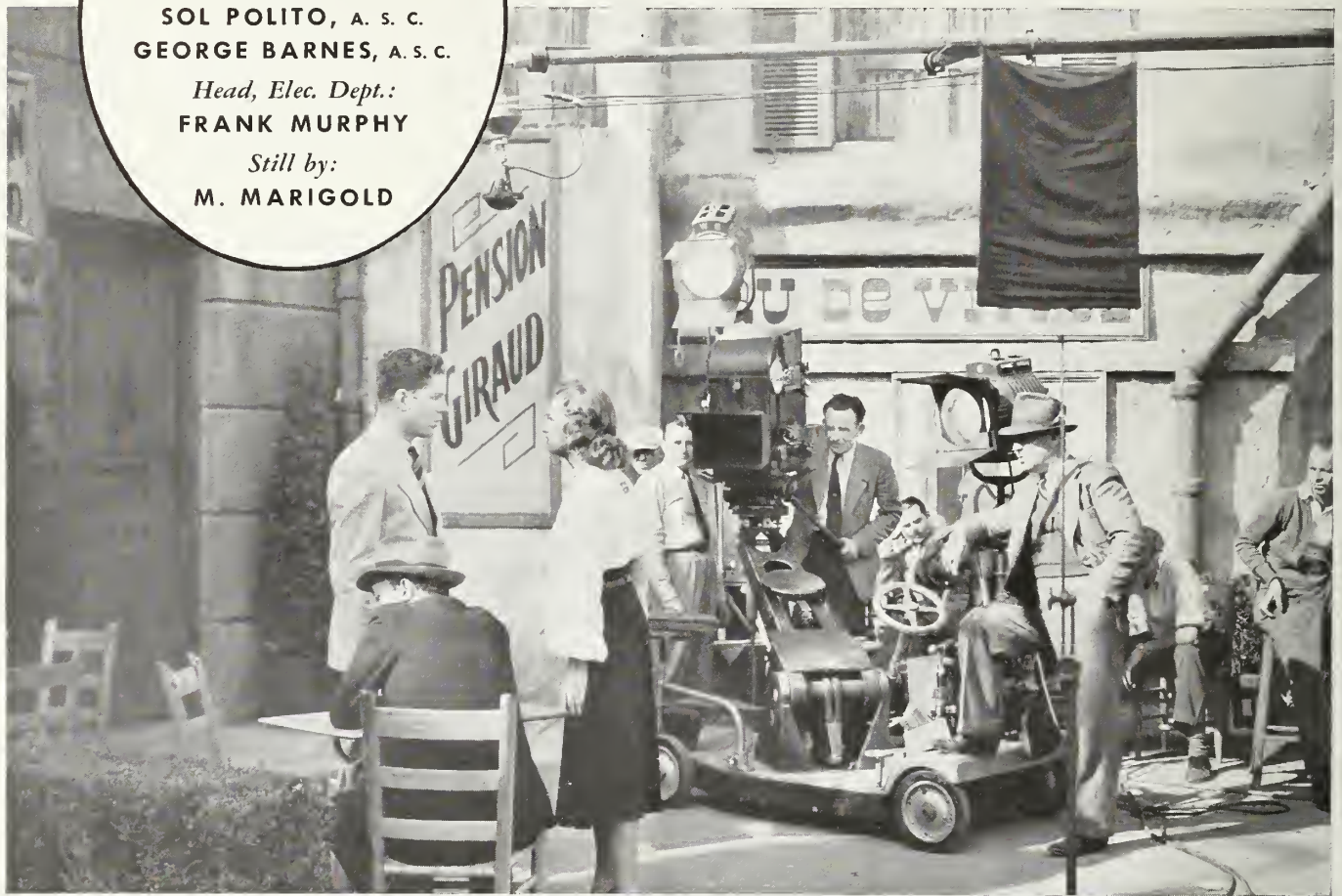
Director:
RAY ENRIGHT

Cameramen:
SOL POLITO, A. S. C.
GEORGE BARNES, A. S. C.

Head, Elec. Dept.:
FRANK MURPHY

Still by:
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G-48 Spotlight

Add to this that they go into action fast; are especially handy for lighting cramped quarters; and permit faster, more efficient shooting schedules, and you will quickly see why they are so widely used.

There is a type and size to meet any need from general set lighting to special effects and process work. Are you benefiting fully from this versatility? General Electric Company, Nela Park, Cleveland, Ohio.

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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

NEWS OF THE MONTH

Hollywood Upturn

Studio production reaches new highs; excise tax off influences price reductions in many lines.

Important developments during the past month were a marked upturn in Hollywood studio work, with many crafts of the International Alliance in the studios working at full strength; and elimination of the manufacturer's excise tax July 1st, which brought a number of price changes, particularly in camera and similar fields, and promises to bring further revisions in wholesale and retail prices. Announcements of price cuts on standard items already are being made and many changes in models also are expected.

With the major studios putting rush productions into preparation or shooting to reach new peaks of activity, Hollywood took on a tone of optimism in contrast to the slump jitters of early spring months. The motion picture industry expected to share in the benefits of the sensational stock market upturn and other evidences of a national trend away from recession.

Highlights in improved progressive steps, particularly in improved sound recording and reproduction methods, color photography and in the 16 mm. field were getting past the gossip stage. In next month's issue we expect to present late news on such developments. Bell & Howell's announcement of their new magazine-loading Filmo 16 appears in this month's Tradewinds.

Of particular interest in this month's issue is D. K. Allison's first publication of important new trends in laboratory control methods, which appears among the Technical Articles, while the Society of Motion Picture Engineers' report of theatre standards in the same section should interest all industry technicians.

Contest Extended

The Kalart Company has extended their second Synchro-Sunlight photography con-



\$162,000 TO \$1 SHOT. Here's a Leica shot on which almost any expert gambler would give odds of \$100,000 to \$1 or more that you couldn't duplicate it within a month. Mathematical experts tell us it would be a cinch bet and that the odds against any individual getting such a picture within six months if he haunted golf courses all day and used enough film for a major production are incredible. The picture was snapped at the exact moment just after a golf club-head broke during a drive. It was made with a Leica by Jack Warren, member of Local 659, IATSE, several years ago. The golfer is Fred Karger, member of Local 47, American Federation of Musicians, and now featured pianist at Sardi's in Hollywood.

test until November 1st. First prize is \$100; second prize, \$50; third, \$25; and there are 15 additional prizes of \$5 each. A folder containing details of the contest may be obtained from dealers or by writing the Kalart Company at their New York headquarters or Hollywood branch.

Protize Process

New treatment assures protection of green prints. *By Sydney P. Solow, Consolidated Film Industries.*

The projection of "green" prints has always been one of the vexing problems of the motion picture industry. During the first few runnings of a picture, the gelatine emulsion is extremely susceptible to abrasions and scratches and has a tendency to accumulate dirt and other foreign particles. In the case of exhibition prints, the "greenness" of the film disappears after a few runnings; and, if the film has safely survived its initial handling period, no further trouble may be anticipated.

Dubbing prints, process keys, and other film tools of the studio, however, present a different problem. These prints have no aging period or first-run showing. They are used only a few times or perhaps even only once; and, if there is to be no compromise with the quality of the finished product, they should be free from any defect. Dubbing prints should remain clean and abrasion-free after repeated rehearsals and many handlings lest undesirable frying and crackling noises be introduced; process keys should remain free from scratches, abrasions, and cinch marks through all the takes in which they are employed.

What the motion picture technician needs, obviously, to insure these conditions is a method of treating the film so that the emulsion is transformed from a delicate, easily-mutilated material into one that is mechanically rugged and resistant to injury. Any protective process offered to the industry should fulfill the following specifications:

1. It should be inexpensive.
2. It should be capable of easy and quick application.
3. It should be without effect upon the photographic image.



NEWSREEL HIGHLIGHT. Last month the news-reel boys had a flash at the newest and biggest airship from U. S. factories. Top, America's Leviathan of the air, 32 tons of aeroplane on the wing, the new Douglas DC-4, a million-and-one-half dollars investment in sub-stratosphere commercial aviation of the future. Center, the new air monster on her maiden flight from Clover Field, Santa Monica, she soars over Los Angeles; Lower left, Al Brick (659, IATSE) of Movietone-News shooting a close-up of one of the 1400 H.P. motors; and Lower left, the news-reel boys making shots at Clover Field before the take-off. Hearst News of the Day cameraman Roy Kluver with soundman Carl Bjerre at left; and just in the picture at right is Al Brick with his Pacific Coast supervisor, Jack Darrock at his left. Top pictures courtesy Douglas Aircraft Corp., and bottom strip by Warren McGrath, Fox Movietone soundman, and member of Local 695, IATSE.

4. It should not cause the film to become brittle.

5. It should not interfere with normal film technique, viz.: splicing, projection, etc.

6. It should reduce the tendency of the emulsion to accumulate and retain dirt and other foreign particles.

7. It should be effective in preventing scratches, abrasions, and cinch marks.

The Protize process, recently announced to the industry by Consolidated Film Industries, Inc., is the result of three years of experimentation devoted to the development of a protective treatment that would meet the above-mentioned requirements. The process consists of the application to the emulsion, by means of a cloth covered roller, of a fluid which effectively toughens and lubricates the film. The gelatine layer of the film thus treated cannot be scratched by ordinary means. Moreover, the original moisture content of the gelatine is retained even when the film is subjected to prolonged heating; thus there is conferred upon the emulsion a pliability that is permanent. Owing to the lubricating effect of the process, edge-waxing of prints is unnecessary if they are intended for use in an ordinary type of projection machine.

MPPC Opens

Delayed a few weeks by the usual complications of getting a new building straightened away for operation, Motion Pictures Process Corporation, new rear projection and special effects organization, was slated to be "ready for business" early this month in a brand new plant at McCadden Place near Santa Monica Boulevard in Hollywood.

Featuring a modernized and stream-lined Newmatz rear projector, which MPPC also will market as international distributor under a ten-year contract, the new plant has ultra-modern facilities for special effects work. Maximum set space in the 60x150 foot plant is 60x70 feet, and there is a complete array of new Flat Light screens. Largest screen is 16x20 feet, which is next to MGM's huge 20x35 foot screen installed for "Test Pilot."

Convenience and efficiency feature the new Newmatz projector setup, which will be previewed at the MPPC opening early this month. Features include: remote control focusing of image on the screen by the camera operator; a handy speaker system between the camera and projector operators; and of outstanding interest, a stream-lined blimp on the projector, replacing the huge "ice-boxes" now in general use on other types of projectors. This eliminates 75 per cent of the weight. The outside dimensions of the Newmatz are 4 feet long by 3 feet wide by 6 feet high against the average of 8x8x8 feet of the "ice-boxes."

Heads are interchangeable on the same base and the lamphouse for the motion picture projector and still stereopticon are the same.

The new structure has a fireproof film vault for an extensive library of still and motion picture background plates, modern dressing rooms, and every technical feature necessary for modern special effects photography in either black-and-white or color, including latest type Bardwell & McAlister and Mole-Richardson lamps.

The new organization has John Gentile, long with the Motion Pictures Producers & Distributors, as general manager, and Roy L. Davidson, well-known in Hollywood, as chief technician. A pictorial layout of the new plant and the new Newmatz projector will appear in next month's INTERNATIONAL PHOTOGRAPHER.

By Herbert Aller

LENS STOPS STANDARD F-SYSTEM										
Read This Table Down ↓	RELATIVE EXPOSURE REQUIRED								F Value	
	16	1	2	4	8	16	32	64	128	16
14.3	1 1/4	1 1/2	3	6	12	24	48	96	13.8	
13.1	1 1/2	1 1/4	2 1/2	5	10	20	40	80	12.6	
11.3	2	1	2	4	8	16	32	64	11.3	
10.1	2 1/2	1 1/4	1 1/2	3	6	12	24	48	9.8	
9.2	3	1 1/2	1 1/4	2 1/2	5	10	20	40	8.9	
8	4	2	1	2	4	8	16	32	8	
7.2	5	2 1/2	1 1/4	1 1/2	3	6	12	24	6.9	
6.5	6	3	1 1/2	1 1/4	2 1/2	5	10	20	6.3	
5.6	8	4	2	1	2	4	8	16	5.6	
5.1	10	5	2 1/2	1 1/4	1 1/2	3	6	12	4.9	
4.6	12	6	3	1 1/2	1 1/4	2 1/2	5	10	4.5	
4	16	8	4	2	1	2	4	8	4	
3.6	20	10	5	2 1/2	1 1/4	1 1/2	3	6	3.5	
3.3	24	12	6	3	1 1/2	1 1/4	2 1/2	5	3.2	
2.8	32	16	8	4	2	1	2	4	2.8	
2.5	40	20	10	5	2 1/2	1 1/4	1 1/2	3	2.4	
2.3	48	24	12	6	3	1 1/2	1 1/4	2 1/2	2.2	
2	64	32	16	8	4	2	1	2	2	
1.8	80	40	20	10	5	2 1/2	1 1/4	1 1/2	1.7	
1.6	96	48	24	12	6	3	1 1/2	1 1/4	1.6	
1.4	128	64	32	16	8	4	2	1	1.4	
F Value	RELATIVE EXPOSURE OBTAINED								↑ Read This Table Up	

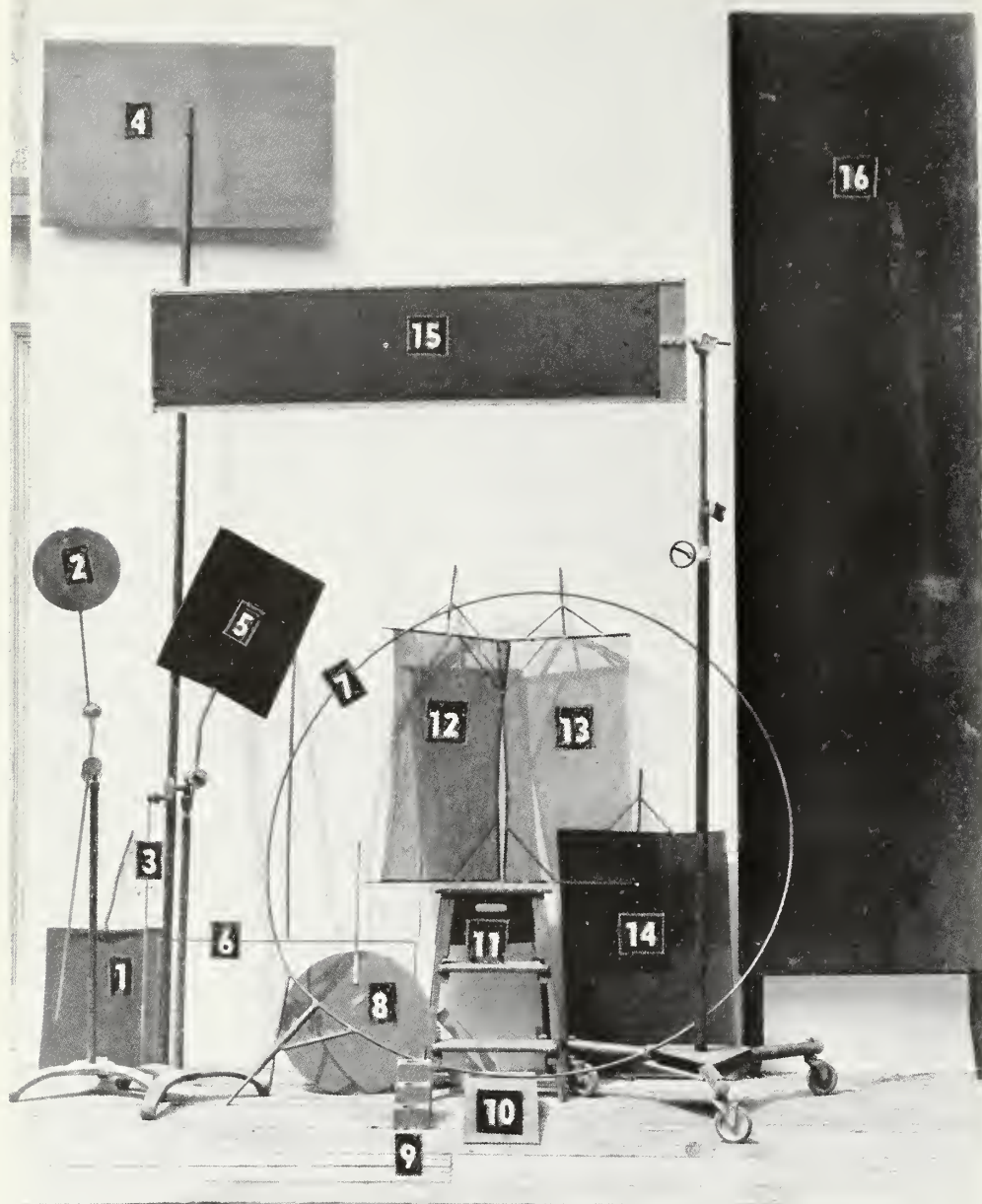
on a light backing and using no front light is 1/15 of second at f:11.

"Many pictures lend themselves to shades

and shadows. That is why silhouettes when properly done can leave a lasting impression upon onlookers."







GRIP EQUIPMENT. 1—Goose neck flag. 2—Century stand with spot or disk. 3—Century stand, double extension arm. 4—Meat ax. 5—Century stand with goose neck flag. 6—Baby reflector holder. 7—Butterfly hook or large diffusing ring. 8—Large spot or disk flag. 9—Furniture block. 10—Camera track wedge. 11—Three step ladder. 12—Double scrim or bob-bo-net. 13—Single scrim or bob-bo-net. 14—Large flag. 15—Jumbo stand with cheese cutter. 16—Nigger or sun arc gobo.

Grip Equipment

Introducing the preliminary groundwork for Studio Mechanic's Handbook; devices used to block off light for shadow effects in photography.

By George M. Haines, Local 37, IATSE

Equipment used on studio backlots is so extensive and varied that one scarcely knows where to begin in cataloging the many items. Also, while this series is intended to be published eventually as the first complete and authentic handbook for the backlot studio mechanics, the obvious eventual arrangement of the material in alphabetic order under proper headings is not as easily handled for practical publication purposes as might be the case if this series were to be presented with all the material already in hand.

One big feature of this series is that its success depends upon the cooperation of a host of veteran "IA" members in supplying information

and authoritative facts. Gathering of this material requires considerable detail work and while we already have a huge collection of information and have blocked out general groupings, it already has been discovered that the task of compiling this material can not be approached with rigidly pre-conceived plans for its format or its monthly presentation in *INTERNATIONAL PHOTOGRAPHER*. The practical problems of gathering pictures and information have a large bearing on such a project and our present plan is to work as close to the eventual format as possible within practical limitations.

We are counting greatly on the cooperation

of able "IA" members, studio executives, the manufacturers of equipment and materials, and the stillmen members of Local 659 in teaming together to make this a valuable reference work in this field. One eventual aim is to gather together into one carefully organized volume all factual information on every piece of equipment used in and around motion picture sets; in other words, anything connected with the work within the established jurisdiction of Local 37 of the "IA." This information will include photographs and diagrams, where needed, factual and statistical information, slang descriptions used at various studios, minimum specifications, etc.

Obviously no other organization but the "IA" and its technical journal, *INTERNATIONAL PHOTOGRAPHER*, could hope to accomplish such a task without a staggering expenditure. We hope to do the job efficiently with the cooperation and advice of those mentioned. We sincerely believe that the final result will be a practical and serviceable reference work upon a complex branch of motion picture production that hitherto has not been much discussed in technical and trade journals.

We also sincerely hope that this collating and pooling of practical information will prove of value to the 8000 members of Local 37, who daily make important if unsung contributions to motion picture entertainment.

The initial group of items illustrated on this page is grip equipment and deals with the production of shadow effects, with the exception of Nos. 9 and 10, which are handy accessories on the set. These various items are used by the grips in assisting the photographers, the gaffers and the juicers to achieve effective and natural lighting arrangements. After the set lighting arrangement for a particular shot has been worked out by the camera and electrical crew, it then frequently falls upon the grips to undo some of this work with various pieces of equipment used to block off light.

However, the undoing always is in the interest of a more artistic finished picture, for in professional motion picture production, often with straight uncorrected light, no matter how excellent the equipment and skillful the arrangement, the result is not perfectly satisfactory. This is particularly the case in those subtle little touches of light and shade that distinguish Hollywood photography.

A host of varied devices and gadgets are used for the blocking off of light. They range in design and materials from sheer gauze that produces but a slight diffusion to devices for completely blocking off the light at one particular part of a set. Their creation is, of course, to the credit of that "Mother Necessity," whose off-spring are "inventions." Never before in commercial manufacture had there been need for such odd combinations of materials; and consequently most of these gadgets were devised by ingenious technical workers to fit some particular problem, then gradually improved on and developed until they became a part of production routine.

The picturesque slangy terminology used to describe studio set devices in general is indicative of the hybrid and off-hand manner of their creation and development. They are the product of the laboratory of practical picture making. Unimpressive as they may look when stood up stiffly in a group on exhibition as in the accompanying illustration, these gadgets are extremely valuable to the Hollywood production routine. If their use were suddenly forbidden, it is safe to say that artistic motion picture photography would slide back ten years in quality.

The initial set of 14 items illustrated on this page are described with a few words in the caption. They will be discussed individually in greater detail in coming issues.

The two sets of little blocks, Nos. 9 and 10 at the bottom of the picture, are very handy on any set. The furniture block (No. 9) is used to elevate objects on the set to correct per-

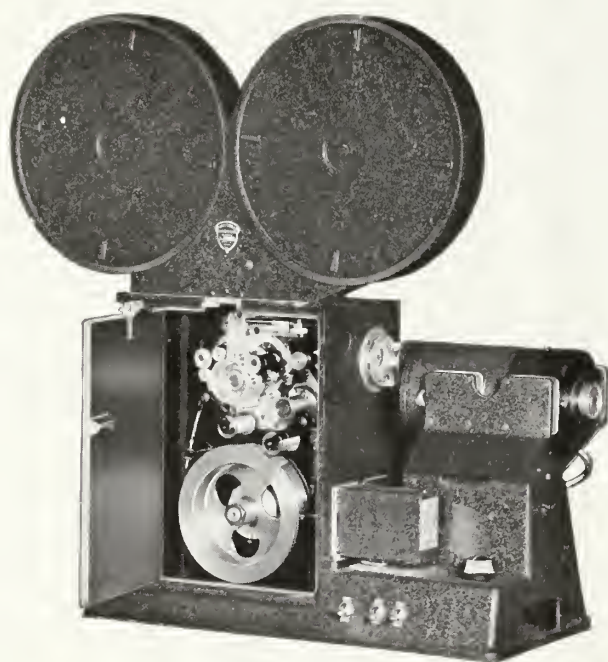
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spective, and particularly to adjust effects to stars whose linear proportions are not the photographer's ideal. The camera track wedge (No. 10) is a miniature ramp that has many uses in facilitating the movement of camera dollies and other heavy objects on sets across low obstacles and to slightly higher levels.

Color Course

Don Hooper, 683, IATSE, heads new Beverly Hills School of Photography.

Inauguration of a series of evening courses in photography, with which experienced professionals with extensive Hollywood experience will be associated gets under way this month at the new Beverly Hills School of Photography, headed by Don Hooper, member of Local 683, IATSE. Initial course, consisting of eight weekly lessons, starting on Tuesday, July 19, will cover color photography. The course will total 12 weeks, since after the first eight weeks an additional month will be devoted to students working out assignments using their own equipment.

Headquarters of the new photographic school are at 417 North Beverly Drive, Beverly Hills, and the courses will be conducted there to a limited enrollment. The course will be preceded by a special invitational group of lectures to be presented on July 12 at the Beverly Hills High School.

Hooper has been a frequent contributor to INTERNATIONAL PHOTOGRAPHER. He recently has been associated with Western Lithograph Company, where he created their color photography research laboratory, was technical demonstrator for the Thomas S. Curtis Laboratories, Inc., and has been instructor of photography at Los Angeles City evening high schools.



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Handbook Delayed

New series by Murdock on art of make-up due in early issue with many illustrations.

Last month INTERNATIONAL PHOTOGRAPHER announced two new handbooks to join its Books of Table series. Initial article of the Studio Mechanics Handbook, edited by George Haines, member of Local 37, IATSE, with the cooperation of Lew C. G. Blix, secretary of Local 37, and a group of veteran members of the IA's big studio mechanics local, appears on Page 14, but the inaugural article of the companion series, the Make-up Artists Handbook, edited by Vern Murdock, business representative of Local 706, IATSE, has been held up, due to the editor's attendance at the annual convention of the IATSE & MPMO at Cleveland last month.

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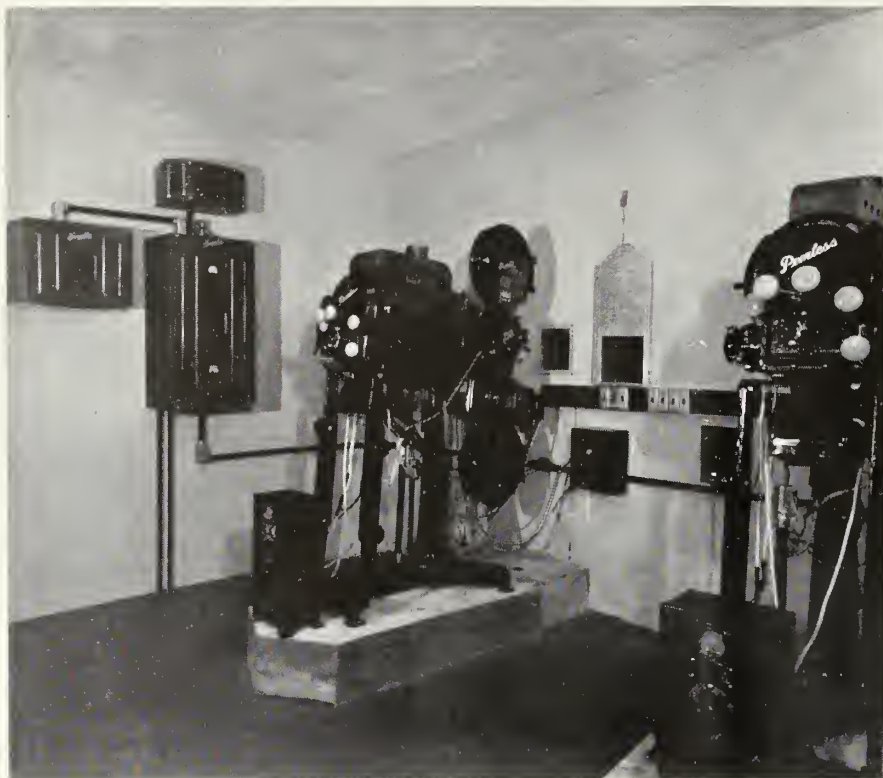


JACK O'HARE

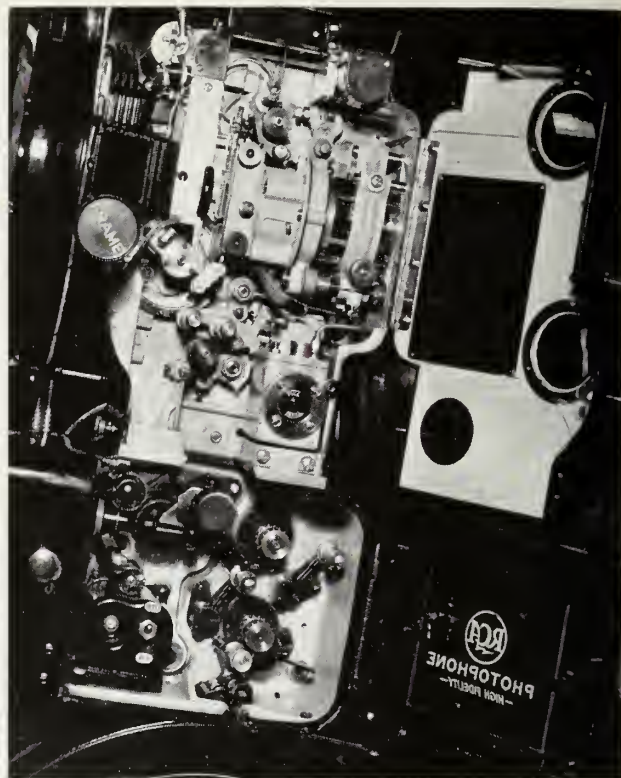
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Number 4



Number 2

All illustrations on this page are described in the accompanying story.

Projection Notes

Latest information on Simplex E-7 and preview model projector. By Paul R. Cramer, Local 150, IATSE.

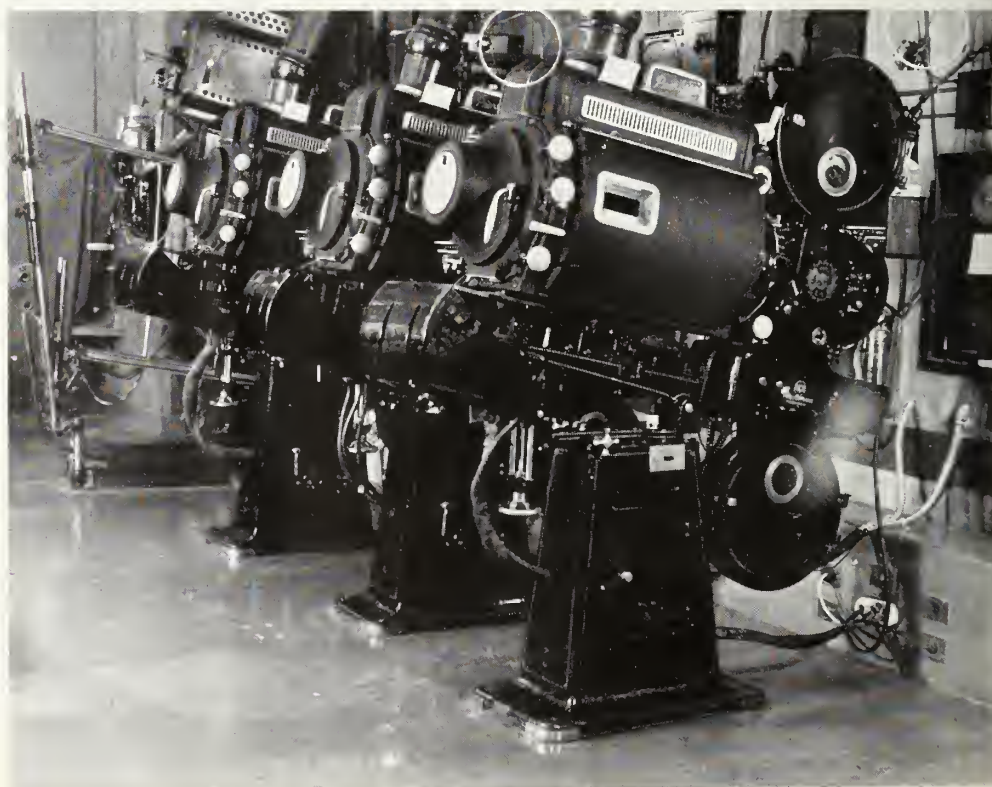
In answer to a question by one of the brother members of Local 150, IATSE: "Has anyone discovered a way to successfully stop the cooling fan on an E-7 Simplex from drawing the gasses out of the lamphouse in the booth?" the timely question draws a welcome "yes." It is a pleasure to not only explain the solution but also to pass on a boost for Herbert Griffin and his Inter-

national Projector organization for hitting upon something that may revolutionize the projection booth as far as sound-proofing and lamp heat regulation are concerned.

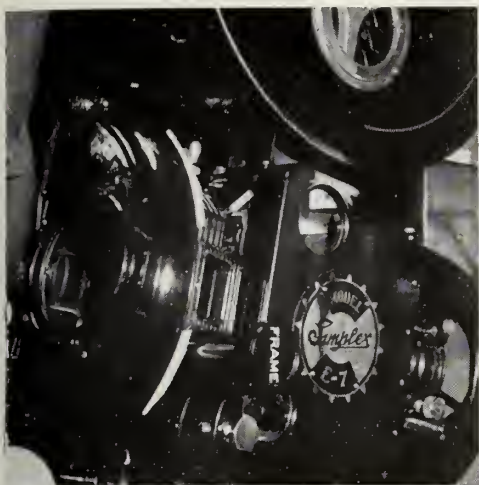
The method of stopping the draft is simple, as are all really great things—they usually are so simple we wonder why someone didn't think of them years ago—but in this case, the solution awaited the discovery in another field of the ingredients and methods of making the article that the International Projector organization has adapted to solve this problem. Our description of the article will have to be quite meagre, inasmuch as there are only two sets out, one at the Chinese in Hollywood, the other at the Alexander in Glendale, California. Brother Fred



Number 3



Number 1



Above, close-up of the new attachment for Simplex Model E-7 (described in accompanying story) which may revolutionize projection practice in sound-proofing and lamp heat regulation; and at right, a "preview" shot of the new Simplex preview model, now in operation at the Alexander, Glendale, California.

Weaver (Local 150, IATSE) of the Chinese assures me that the system works excellently. It still is being experimented with.

Method used is a stereoptican slide idea, incorporated into the projector design just to the rear of the rear shutter (as illustrated in the accompanying picture) in place of the usual cone that fits into the mouth of the lamphouse. There is a gadget that is shaped similar to a regular slide holder; and into this slide holder is slipped or placed a piece of optically flat, clear, heat-resisting material capable of holding and dissipating terrific heat (much more than ever will come out of a projection lamp). This piece of optically flat, clear, heat-resisting material stops all draft from the rear shutter fan, as well as stopping the mouth of the projection lamphouse, thereby giving the projectionist better control of the projection lamphouse itself.

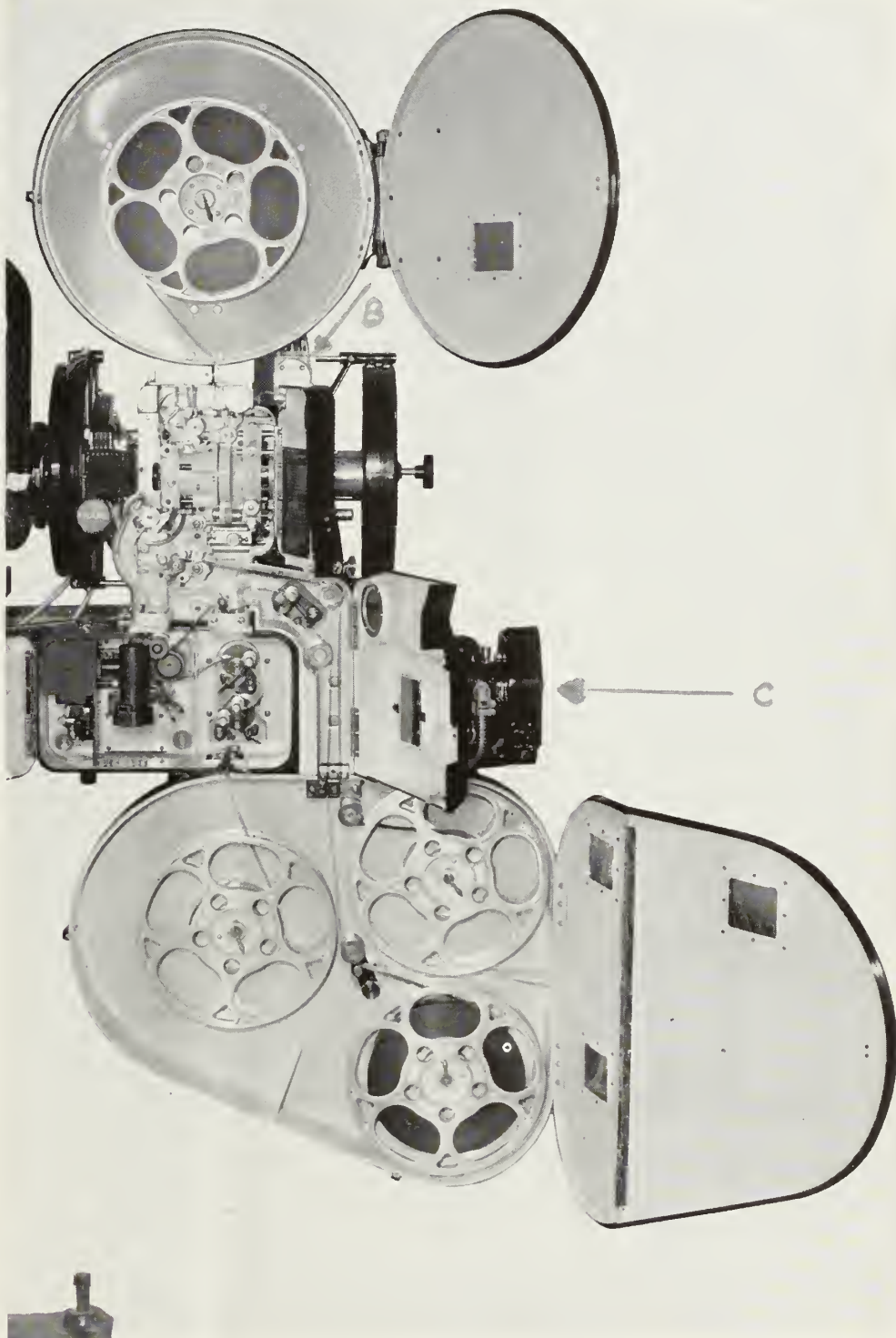
Brother Weaver assures me that it is virtually impossible to tell when the glass is in or out. There is a slight waver as the edge of the glass passes the light beam, during its insertion, but otherwise there is no telling, as far as the audience is concerned, whether the glass is in or out.

1913 to E-7

Last month we promised some dope from Brother Weaver about the new E-7 Simplex, recently installed at the Chinese. The accompanying pictures show the new Chinese setup, which is under the care of Brothers Weaver, Schroeder, Luppy, Babcock and Greiner, all of Local 150, IATSE.

In Number 1 you will see the copper water pipes (in circle). This water pipe formerly supplied the cooling jacket around the old aperture plates with cold water; but thanks to the new cooling system of the E-7 Simplex these pipes will no longer be necessary, thereby taking away another worry of the projectionist.

Number 2 shows a close-up of the E-7 projector head and the RCA push-pull sound head. I know that it will be unnecessary to suggest that you note the extreme cleanliness, sturdiness and simplicity of this projector head, from the general utility lamp at the top of the head to the one shot oil system at the bottom, the top loop fire trap that really works, the adjusting screw that gives you control over the tension shoes, the extra length of the tension shoes, and the oil well on the bearing of the intermittent sprocket. Last but not least note the new type douser and bracket that Bro. Weaver has made especially for this new Simplex E-7.



After a close study of the accompanying photograph, one cannot help but praise the handiwork of the International Projector people for turning out such a truly remarkable piece of workmanship. Not only is the projector visually far advanced, but there are unseen advancements that make it truly a great piece of equipment, such as having all the sprockets and rollers and in fact all parts of this projector that touch the film in any way have been machined away so that all that touches the film is from the center of the sprocket holes outward, thereby preventing all of the old time damage to film from scratches. This, I should say, was quite a jump on the Academy Research Council's damaged film report.

Just to digress a moment, compare this latest thing in the art of projection with the projectors in Number 3. The center shot, taken at the American Theatre at Fifth and Broadway, Los

Angeles, in 1913, and top picture of the Powers projector at the College Theatre at Fifth and Hill, also 1913. The projector used at the American Theatre was an Edengraph and the projectionist was Brother Harold Sailor of Local 37 and 150, IATSE. Note the size of the booth at the American and the big marble slab that the projector was set upon, also the open light at the aperture plate, and naturally the accompanying strain on the projectionist's eyes as well as the fire hazard. Even as late as 1913 the use of an electric motor to run the projector was against the law. As I remember, these photographs were taken by the light of the arc of the projection lamp of the second machine we used on Saturday and Sunday, a sewing machine type Motiograph.

In the top picture of Number 3 on the shelf in the rear of the Powers projector you will see the powerful open work wire wound rheostat

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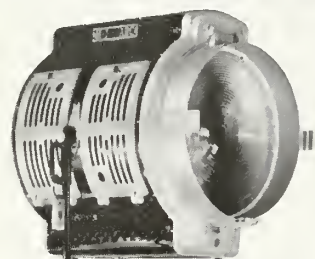
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in use at that time and the ultra heavy wall switches that were used. Note the position of these wall switches, where we had to reach over the hot lamphouse to cut the juice so we could trim the carbons.

In the bottom photograph we see the corner of Fifth and Hill Streets in 1913, with the gas lights in the lobby of the then luxurious College Theatre, and the old Occidental Hotel across the street and the New Hotel Clark that was being built next to it. Incidentally, the snappy roadster with the turtle back was one used for film delivery in the Tally circuit.

Swinging from this "ultra modern" era of 1913, let us make a dash over to the Alexander Theatre, Glendale, Calif., where Fox-West Coast is installing a complete outfit of the new Simplex Sound System. In fact everything in the booth is new but the lamps.

This installation took place June 22, 1938, and is the first Simplex installation for Fox-West Coast, as well as the largest installation the Simplex people have undertaken of the more than 100 sets they have installed to date. It will not be possible to get an accurate account of the performance of this equipment until next issue. But inasmuch as there were several reels of various productions of different studios run off for test purposes, we can say that the equipment was not found wanting, but the final analysis will be after the studios have run two or three previews on this new system.

Now let us get to part of this equipment that is of utmost interest to the projectionist, namely, the projector head, and the changes made necessary by having a preview attachment added, as pictured on Page We have printed a picture of the projector head of the E-7 at the Chinese in Hollywood, for comparison purposes in the layout on Page Please note the radical change of the position of the oil reservoir of the head installed at the Alexander and the flywheel, out in front of the motor instead of between the motor and the head, also the compact carrier for the new piece of heat-resisting material to stop the draft at the mouth of the lamphouse.

Personally, I think the new location of the oil reservoir is much better than the old location. It takes the oil out of the bottom of the projector and puts it on top and to the side of the projector head where it can be taken care of much better. Should it become necessary to put a preview attachment on your equipment, there are no last minute changes to be made in the head, so we all can enjoy the advantages of different types of preview attachments.

Brother Frank Hibbert of Hibbert, Platt, Urlik, Bradley and Tart, all good members of the projection crew at the Alexander, and of Local 150, IATSE, tells me that the new preview attachment is a honey. As you can see by the photograph it is a permanent installation and is easy to handle. The big door of the lower magazine has a hinge in it and when the attachment is in use the whole door opens but when standard or composite prints are used the front half of the door closes and just the back half or the portion over the large reel is used. This is a big advantage.

While talking to R. H. McCollough, supervisor of projection of Fox-West Coast, he explained that the work being done at the Alexander in Glendale is part of the routine employed by the circuit to keep pace with the constant improvements in sound and projection as they are tried and approved by the technicians in the studios.

Picture Number 4 is a good view of the first western installation of the Simplex sound system, at the San Carlos, Phoenix, Arizona. We had this picture made before we obtained the exclusive shots of the Alexander, Glendale, just before going to press.

(The installation of the Powers projector in the College Theatre at Fifth and Hill Streets, March 12, 1912, was done by John Filbert, then located in his store at the corner of Sixth and Main Streets, in the Severance Building.)

TECHNICAL ARTICLES

Analytical Methods in Lab

Scientifically accurate methods for analysis of developing solution for rational replenishment system with its resultant economies and improved efficiency.

By D. K. Allison

Recent papers by Messrs. Hanson and Evans of Eastman Kodak Co., and others, have indicated the need for analytical methods whereby the concentrations of the various components of the developing solution may be estimated, in order that rational replenishment and its resultant economies may be effected. The accompanying method of developer analysis will assist the laboratory chemist to maintain the operating characteristics of the developer substantially uniform at all times. (See Page 22.)

Numerous tests have shown that the factors pH, Eh, and rH, coupled with a consideration of the sulfite and bromide concentrations present, are of primary importance; the concentrations of carbonate, borax, or other alkali are important only in their relationship to pH and buffer index.

Because of the wide range of concentrations, and the various manufactures of de-

veloper constituents encountered in the various film laboratories, it is suggested that the chemist carefully compound a fresh developer by his formula, analyze it according to the following methods, and thereby determine the factors for conversion to his particular constituents. For example, in a developer known to contain 75 gms. per liter of sodium sulfite, heptahydrate, of a certain manufacture, there is found by analysis to be 39 gms. anhydrous sodium sulfite, future determinations of sulfite in this developer would use the factor $75 \div 39 \times 1.26 = 2.42$, in place of the factor 1.26 given in the table.

The author wishes to thank Mr. A. M. Gundelfinger and the research staff of Cinecolor Films for their cooperation and assistance in the testing of these methods, and for the determination of bromide in old developing solutions.

see things every instant that we are awake and that we are almost helpless in the dark, yet how many of us have even a rudimentary knowledge of how and why the different light sources play such an important part to the craftsmen throughout the industrial world; the artists and color-photographer? Each of them requires the type of light which is most suited to the type of work he is doing. The appearance of a piece of fabric in a color photograph is looked at from a much different viewpoint than the appearance of the same fabric is regarded, say, by an inspector at the factory.

The barber's view of our face is quite different from that which we present to our hostess.

Similarity of human vision and the camera has been known or surmised for a great length of time. Vision is, in actual fact, a complete photographic process combining all the elements of color-photography and television; in fact, it is identically the same up to the point where the light strikes the light sensitive surface. It is commonplace to say that vision to color and color-photography is dependent on the proper light, and the truth to state that the true value of color by vision or photography is no better than the light condition. We know that we see better under certain conditions of light than others, but the fact that bright light is better than dim is about the extent of common knowledge on the subject.

In recent years the question of providing the workman with suitable light for his use has received increasing attention. A system of measurements of light in its various ap-

The Basis of Color Photography

"Light and Lights Sensitive Surfaces" is second article in series on color fundamentals; lays ground-work for understanding of color balance.

By Charles Hoffman, Local 583, IATSE

When we see colored objects, be it a piece of fabric or any other kind of object, we know that no matter how brilliant the color appears, we shall not be able to see its color in dim light; such as moon or star light. We realize, therefore, that color is not a property of the object alone, but that it depends upon the presence of light.

The reason the objects appear in color is because they possess the property of absorbing some of the color rays of light falling upon them and reflecting others. Color is the result of absorption, transmission, and reflection of light. To understand this, we must examine the theory generally held, and now very well substantiated, as to how the eye perceives color. Vision to color—you may say—has nothing to do with color-photography and knowledge thereof is not essential to successful practice. Yet it will frequently be found of great assistance if a clear understanding of the underlying principles is possessed.

Some facts are so familiar that we sel-

dom stop to consider their exact relation to our every-day life. We know that we

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plications, and instruments for making the measurement, has been fully worked out, as have devices for directing light so as to utilize the rays of the various light sources in the most economical manner and that is eminently practical.

The photographic film of the eye called the retina corresponds to the gelatine of the photographic emulsion. Through it are distributed a great number of microscopically small nerve cells containing chemical substances that are acted upon by light, and which perform the same function as the particles of silver salts in the photo emulsion. The cells are of two kinds, called respectively *rods* and *cones*, due to their general shapes. The retina comprises two different photographic emulsions. The cones are adapted to taking pictures, where sharp-

ness of detail and full color representation is required, as in color-photography, and resembling a screen-plate. They are relatively "slow," requiring a fairly high intensity of illumination to produce a visible picture. The rods are extremely rapid but incapable of producing sharp definition or of showing color. The rods resemble the color blind emulsion, but supply the visual picture when the light is dim. In the retina just off the optical axis is a little depression in which there are only cones. This is called the *fovea*. Covering this is a thin transparent tissue of yellow color which acts as a filter against the ultra-violet rays, the same as the yellow filter is used in conjunction with a panchromatic film.

The fovea is especially adapted to producing the color picture in which the ut-

most sharpness of definition and discrimination of small objects is required. All of the field within our visual range which we see distinctly at any one instance is a part of the image that falls upon this little dent. This area is very small, and fairly well represented by this capital letter (**O**), on the page before you. You can readily verify this by fixing your focus on this letter and observing the sharpness of the adjacent letters. If the eye takes a very small picture, how is it that we still can see half-way around us? The explanation is that the eye really is a motion picture camera capable of taking many pictures per second (a field of investigation still being explored by scientists).

Light falling upon the retina does not instantly cease when the image is removed,

The LABORATORY BOOK of TABLES

By D. K. Allison

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ANALYSIS OF DEVELOPING SOLUTION

SODIUM SULPHITE	POTASSIUM BROMIDE (Rapid Method)	pH	Eh	SODIUM CARBONATE (electrometric)	POTASSIUM BROMIDE (determination in old developer)	HYDROQUINONE
Pipette 5.00 ml. sample of developer, with vigorous stirring, into 100.0 ml. 0.10 N iodine solution, to which 25 ml. 10% H ₂ SO ₄ have been added. Titrate excess iodine immediately with 0.10 N Na ₂ S ₂ O ₃ to straw color. Add 10 drops Solution G, and continue titration to disappearance of blue coloration.	Take 50.0 ml. sample, make acid to litmus with 50% H ₂ SO ₄ , then add 5 ml. excess. With stirring, add 25.0 ml. 0.10 NAgNO ₃ . Add 5 ml. Solution J, titrate with 0.10 NKSCN to first pink color.	Measure the pH of 100 ml. sample, using the Allison pH Meter or the Allison Electrometer with the glass electrode.	To a 50 ml. sample add 1.0 ml. Solution N. Measure reduction potential EMF at 20°C. using Allison pH Meter or the Allison Electrometer with gold electrode. Convert to Eh, by the following equation:	Titrate a 50.0 ml. sample with 0.10 N HCl to first point of inflection, using the Allison pH Meter or Allison Electrometer with glass electrode. (see directions for Electrometric Titration, Int. Phot., May, 1938.)	Take 100.0 ml. sample, make acid to litmus with 50% H ₂ SO ₄ , then add 10 ml. excess. Filter.	Add 5 ml. 50% H ₂ SO ₄ and 20 gms. KCl, stirring to 50.0 ml. sample, stir with heating until effervescence ceases. Cool, place in separatory funnel and extract six times with successive 50 ml. portions of ether. Combine extracts and evaporate to dryness in weighed dish on water bath. Cool in desiccator; weigh.
100—vol. Na ₂ S ₂ O ₃	25.0—vol. KSCN		Eh=.250+ EMFobs	volume HCl	Precipitate	Weight residue
×	×			×	Add 10 ml. 50% H ₂ SO ₄ and 5 drops Solution H. Stir until ppt. light colored, add 50 ml. conc. NH ₄ OH, heat to dissolve ppt., filter, add 5 gms. Zn, stir for five minutes. Filter, wash, combine filtration and washings.	×
1.26	0.238			0.212	Filtrate	20
=	=			=	Reject	=
gms. Na ₂ SO ₃ /liter.	grms. KBr/litter.			gms. Na ₂ CO ₃ /L. Colorimetric		gms. hydroquinone/L.
		rH		Dissolve 5 gms. NaCl in 50.0 ml. sample. Add one distilled water ice-cube, stir until chilled to 5°C. Add 5 drops phenolphthalein solution, titrate with 0.10 N HCl to colorless.		METOL
		Obtain the rH of the developer from the following equation:			Ppt.	To the quesous solution from the above procedure, add 10 ml. conc. NH ₄ OH. Extract three times with 50 ml. portions of ether. Combine extracts, evaporate to dryness in weighed dish on water bath, cool in desiccator; weigh.
		rH=2pH+Eh/0.029			Filtrate	Weight residue
		BUFFER INDEX			Acidify with H ₂ SO ₄ add 50 ml. 0.10N AgNO ₃ 10 ml. Solution J Titrate with 0.10N KSCN to pink color.	×
		Using Allison pH Meter or Allison Electrometer with glass electrode, by method of electrometric titration, determine amount of 0.10 N HCl to produce 1.0 pH unit change in 100.0 ml. sample developer.		volume HCl	50.00— vol. KSCN	20
		Volume CHI=Buffer Index		×	×	=
				0.212	0.119	gms. metol/liter
				=	=	©1938 D. K. Allison
				Gms. Na ₂ CO ₃ /L.	gms. KBr/L.	

DIRECTIONS FOR THE PREPARATION OF SPECIAL SOLUTIONS AND REAGENTS FOR THE ANALYSIS OF DEVELOPER.

Solution G—6 gms. soluble starch, triturated cold, made to 1 liter. with boiling water; 10 gms ZnSO₄ added.

Solution H—8N HNO₃.

Solution J—Cold saturated ferric ammonium sulphate, to which enough nitric acid has been added to cause disappearance of brown coloration.

Solution N—50 gms. K₂Fe (CN)₆ per liter.

Phenolphthalein Solution—5 gms. phenolphthalein dissolved in

100 ml. ethanol, made to 200 ml. with distilled water.

0.10 N I₂ Dilute 250.0 ml. 0.25 N I₂ solution to 1000 ml.

0.10 Na₂S₂O₃ 24.83 gms. Na₂S₂O₃ • SH₂O per liter.

0.10 N AgNO₃ 16.99 gms. AgNO₃ per liter.

0.10 N HCl 10.0 ml. conc. HCl per liter; standardize against Na₂CO₃.

0.10 N KSCN 10.0 gms. KSCN per liter; standardize against AgNO₃.

but gradually fades out—the action corresponding to the moving picture, and depending upon the physiological effect known as persistence of vision.

We have seen that the eye consists of two "films" both changing their sensitivity in opposite directions, according to the amount of light falling upon them. In darkness the rod-film becomes very sensitive, while the cone-film becomes entirely insensitive. As the light intensity increases the rod-film becomes less sensitive, while the cone-film begins to acquire sensitivity; the two processes reacting accordingly. At average intensity, both films take the picture. This change, technically called adaptation, takes place very slowly from light to darkness, but very rapid from darkness to light.

In color photography, as in vision, the final test of all lighting schemes is, HOW WELL CAN YOU SEE? An equally important question is, DO THE THINGS YOU WANT TO SEE APPEAR AS YOU WANT THEM TO APPEAR? How you want an object or scene to appear depends upon circumstances: The light is the source of color; color is dependent on the presence of light. For practical purposes, as in color-photography, we have to deal with "white light."

"White light" is light containing all of the wave lengths found in the average sunlight, and of the same relative intensity. The natural color of an object is the color as seen by white light. Light of a different wave length composition than white produces a different color sensation when reflected from a given surface. Thus, colors that match by day-light may or may not match by electric light.

At high intensities of light, all colors tend to become white, and at very low intensities, black. This means that at high intensities or glare, the light sensitive surface of the eye or photographic camera is generally or locally over-exposed and is not able to record the color; and in the latter case it is under-exposed and can "see" little but black.

The difference of light intensities between bright sunshine and star-light is of the order of two billion to one. The variation of light recorded by the eye, due to its facility of adaptation, is about sixteen to one, while the photographic-emulsion can not record a light variation of over ten to one and upwards. (XX)

Since all color can be matched by the proper admixture of the primary colors, the proper quantity of each color must be recorded in the three color separation negatives of photography. The scene or object must be so lighted and exposed as to be within the range of the photographic emulsion; and it must be properly developed so that the negatives present the full range of tone values. From this it can be seen that over or under exposure only leads to failure, and also it is plain that a color-photographs is no better than the image which produces it.

It is equally obvious that the character of

the picture can be marred, even to the extent of complete ruination, by the quality of the light, photographic-film, and the manner in which it is exposed and developed. Lighting as an applied science has been developed along physical and mechanical lines, giving practically no attention to what happens after the light reaches the light sensitive surface. The fact to be emphasized is that the color-separation negatives are only the beginning in the process of the technique of color-photography, and, as is the fact in vision, the actual process of seeing begins after the light ceases to exist.

The technique of color-photography covers a very large area, and there is no practical book yet written on this subject. The few now in existence contain comparatively little information and rarely touch those problems in color which the practical worker wishes to solve. I recall one book in particular, a very large and expensive one, upon which I spent a great deal of time and learned little in connection with color, but was very well informed about "law."

There are, it is true, some excellent scientific works written on light color and so on down the line, supplying the connecting links that must be known in the technique of color-photography. What should be known, or better still how *much* should be known, depends upon the individual and in what capacity he is engaged in color-photography. It does not require a genius to be a color-technician. On the contrary, it requires only a thorough knowledge of color. A superior aptitude for color-photography will, of course, always produce a superior color-technician because the latitude in color-photography is so large that the craftsman with the best knowledge will naturally do better than the one not so well informed. It also takes a great deal of practice and experience, and one should not feel discouraged when something goes wrong; but set to work to find the cause of the trouble. Don't be afraid to start over again. Experience makes masters.

Before going into the discussion of the process of making the three continuous tone positives that are the basis of color reproduction for the graphic arts, it should be emphasized here that certain fundamentals of color, and particularly the principles and theories of color mixing, must be always kept in mind. The thorough knowledge of color is a stimulating thing to the color printer, the engraver, the lithographer and other graphic arts workers. Generally, the best color photography today is intended for graphic arts reproduction. And all the eager rush to get color prints is wasted ef-

fort if we do not consider color from the standpoint of proper mixing of colors to achieve the final effect.

Balance is a quality that is easier to sense than to explain. Entering into every branch of artistic production it is one of the most important principles of art and embraces many elements, all more or less elusive. Applied to color, it refers to a certain equipoise attained by relating the quantities of different hues, tones, and intensities to each other in a manner which produces a pleasing unity. It is therefore concerned more with the quantities than with the quality of colors.

A color-scheme, though perfect as regards the selection of hues, may be unsatisfactory because the quantities of the colors are not properly proportioned. A color scheme would be unbalanced if, for instance, the reds, or warm colors, so predominate as to produce a scorched appearance; or, if the blues and cold colors were so much in evidence as to produce a sense of chill. These two examples will serve to illustrate crudely what is implied in the term balance.

We know that any color can be produced by the proper admixture of the three primary colors. With this knowledge the color still printer should be able to correctly read and interpret the color densities of the three continuous tone positives. The color quantities being represented in the positive in gray tones, the operator should be able to visualize the resulting color, balance and correct the print plates without going through the entire process. With experience and care he should be able to make the corrections so that the final result would be, if not a perfect at least an acceptable, color print. This would mean reduced cost by saving time, material and labor in the handling of exposed emulsions between the photographer and the engraver.

Bearing in mind the fact that light, as far as human vision is concerned, naturally divides into RED—GREEN—VIOLET, and that the photographic-film of the eye undoubtedly is arranged to correspond or harmonize therewith (no other logical explanation will account for the various color phenomena) we can definitely deduce that the true colors, the source of all other colors, are red, green and blue. These colors may be roughly represented by a scarlet red, emerald green, and a good ultramarine blue.

There are three methods of mixing colors; two perfect methods and one imperfect. There are also two sets of colors capable of producing all other colors by combining or mixing. These methods of mixing color are the additive method—the subtractive

TABLE I

ADDITIVE:	
RED	is one element of white light.
GREEN	is one element of white light.
VIOLET	is one element of white light.
SUBTRACTIVE:	
YELLOW	Contains two elements of white light—RED AND GREEN
MAGENTA	Contains two elements of white light—RED AND VIOLET
CYAN-BLUE	Contains two elements of white light—VIOLET AND GREEN

method and the third, where the colors are placed next to each other as in screen plates. This last method we call imperfect because it will neither produce black or white but is necessary to supply both independently. The black is supplied by interposing the photographic positive, and the white can only be produced by the use of an excessive amount of light. With the additive method it is necessary to supply the black independent of the colors, while in the subtractive process the opposite is the case, and white is supplied independently. With the subtractive process, the three color processes in which we are interested, the white is of course supplied by the paper on which the combination of color is printed. For this process we use the MINUS colors, YELLOW—MAGENTA—CYAN-BLUE. The great difference between the MINUS colors and the PLUS colors as used in the additive method is: the MINUS colors in each instance contain two elements of white light, while the PLUS colors contain only one, as outlined in Table 1.

Therefore, when we print yellow on a sheet of white paper we are absorbing but one ray of white light; namely, the violet, and we are reflecting the two rays of red and green to the eye, and so on. Another difference between the minus and plus colors is that the plus color have the property of absorbing two elements of white light. The difference in purity of color between the two compounds superposed subtractively must be in favor of the minus primary colors. And for the same reason this makes for purity of color in the minus set when superposed subtractively; it also causes a weakening, or dilution, of color when these colors are superposed additively. Each minus color being composed of two elemental rays of light when they are combined additively, an excess of white light is introduced into the mixture. This, of course, is not the case with the plus colors.

An explanation of why this is so will occur to the reader when it is remembered that in the Kromoskop a composite or color picture is formed by the three rays of light, while on the three-color print, with the usual method of observation by reflected light, we have at all times but one volume of illumination. In other words, if a good three-color print be made transparent, or by lifting the three-color tissue off the paper and viewed as a transparency, it would be found to be very weak in color. The blacks will appear gray and the color will be diluted with white. We do not obtain a saturated or full power color. From this it can be seen that each individual color tissue is very light and delicate in tone in regards to density, when we have to consider that the trio in combination make the final picture. Each can only be one-third of the normal strength when producing black, and must contain all the full tonal range to produce all the HUES, TINTS, SHADES when superimposed.

(Next article in this series will deal with the three continuous tone positives.)

SOCIETY OF MOTION PICTURE ENGINEERS Hotel Pennsylvania New York City	
S U R V E Y OF MOTION PICTURE THEATRE STRUCTURES	Please fill in all questions listed below and return this sheet to representative of the society or enclose same in postage paid addressed envelope provided.
ORCHESTRA FLOOR PLAN	
LONGITUDINAL SECTION	
Question No. 1. Mark on above diagrams, dimensions A,B,C,D,E,F,G,H,J,K,L,M,N. Dimension A should be White Picture WIDTH. Dimension K should be White Picture HEIGHT. Dimension L should be Width of Proscenium Opening.	Question No. 5. State type of current and voltage in projection room. AC Volts _____ DC Volts _____
Question No. 2. State seating capacity - A-Orchestra _____ B-Balcony _____ Total _____ Stadium seating is considered an extension of or part of orchestra level seating.	Question No. 6. State focal length of projection lens _____
Question No. 3. Check type of screen in use - A- Beaded or metallic _____ B- Diffusive-mat white _____ C- Other-Describe _____	Question No. 7. State angle of projection in degrees _____
Question No. 4. Check type of projection light source in use. A- Low Intensity _____ Amps. B- High Intensity _____ 1) High-Low (Reflector) _____ 2) Condenser Type _____ 3) Suprex _____ C- A.C. Arc _____	Question No. 8. State year of erection or basic alteration of theatre. _____ Question No. 9. Name of theatre _____ Location _____
Form A-- _____ Form B-- _____ PROJECTION PRACTICE COMMITTEE	

FIG. 1. Survey Chart.

SMPE Theatre Survey Report

First word from Projection Practice Committee on study of theatre technical conditions to set up modern industry standards.

First results of the survey of theatre design by the Projection Practice Committee of the Society of Motion Picture Engineers were presented recently at the spring convention in Washington. The report is published herewith in full. The committee is seeking to eventually set up standards that will supply the exhibition branch of the industry with a complete yardstick for new theatre design and modernization of existing theatres to the end of putting a more satisfactory entertainment on the screen with the greatest efficiency in theatre operation.

Members of the Committee are:

H. RUBIN, *Chairman*, T. C. BARROWS, F. E. CAHILL, J. R. CAMERON, A. A. COOK, C. C.

DASH, J. K. ELDERKIN, J. J. FINN, R. R. FRENCH, E. R. GEIB, A. N. GOLDSMITH, A. GOODMAN, S. HARRIS, H. GRIFFIN, J. J. HOPKINS, C. F. HORSTMAN, D. E. HYNDMAN, J. J. KOHLER, P. A. MCGUIRE, E. R. MORIN, M. D. O'BRIEN, G. F. RACKETT, F. H. RICHARDSON, B. SCHLANGER, C. TUTTLE, J. S. WARD, V. A. WELMAN, A. T. WILLIAMS.

Summary.—For some months the Projection Practice Committee has been conducting a survey of motion picture theatres for the purpose of determining existing conditions under which motion pictures are presented. Following report summarizes data obtained from survey and presents them in form of charts showing ratios of viewing distance to screen width, seating length to seating width, and seating width to screen width. Other charts show distance from floor

to bottom of screen, angle of projection, screen width, and arc current.

The survey covers approximately 600 theatres, and is shown to be fairly representative of entire industry by reason of fact that index figures calculated from the survey for only 400 theatres did not change when the number of theatres increased to 600.

Data presented are to form the basis of an analysis leading to determination of criteria for proper motion picture theatre design.

For convenience in conducting studies on the many projects engaging attention of Projection Practice Committee, several Sub-Committees have been formed which have been working very vigorously on their respective problems throughout the year. However, in view of pressing need for reliable information on theatre structures, that part of the work was pressed forward with all speed so as to be able to report on it at this time.

Another important job that Committee is doing resulted from request by National Fire Protection Association to study "Regulations for Nitro-cellulose Motion Picture Film," with view of presenting to the NFPA any recommendations for changes that the Committee might deem advisable. Accordingly, Sub-Committee on Fire Hazards has completely revised all the NFPA regulations referring to projection rooms, and the material was presented to NFPA Committee on Hazardous Chemicals and Explosives at meeting held at Atlantic City the latter part of May. The latter Committee will probably take several months to consider the recommendations, after which time it is expected that proposed regulations may be presented to the Society, probably as a joint report of the SMPE Projection Practice Committee and the NFPA Committee on Hazardous Chemicals and Explosives, and eventually published in the Journal. We hope to present final report at the next Convention.

Report on Theatre Survey

Motion picture theatre structures should be designed according to standards that will insure satisfactory reception, by the audience, of the screen performance. Need for such standards has been emphasized by the survey made by this Committee of approximately 600 theatres. Charts similar to that shown in Fig. 1 were distributed by the Committee among a number of large companies of the industry whose engineers assisted in obtaining the dimensions requested on the chart. Accompanying the charts were letters describing the purpose of the survey. Instead of mailing charts directly to managers of theatres, it was felt that results would be more uniformly determined if measurements were made and charts filled out by men experienced in such work. Accordingly, field men and the management of RCA Manufacturing Co., International Projector Corp., Electrical Research Products, Inc., National Carbon Co., Inc., Forest Electrical Co., Bausch & Lomb Optical Co., and National Theatre Supply Co. are all to be thanked for their co-operation. In addition, a number of charts were distributed to the delegates to the Convention of the MPTOA at Miami last March.

Although survey includes only about four per cent of total number of theatres in operation in the United States, care was taken so that these 600 theatres would represent a fair cross-section of all theatres of the country. Theatres in every state and theatres of capacities varying from 200 to 4000 seats are included. Averages computed from the survey at a point when 400 theatres were covered showed same index values as when number of theatres surveyed reached 600, indicating that facts obtained are fairly representative of general theatre conditions.

Information obtained from survey reveals fact that basic theatre forms, relative screen sizes, and viewing conditions vary to a very wide extent. Variations in design, as shown in graphs, spread over an extent of at least three times what might be regarded as tolerable. Only 16 per cent of all theatres surveyed proved to have satisfactory conditions for all basic considerations

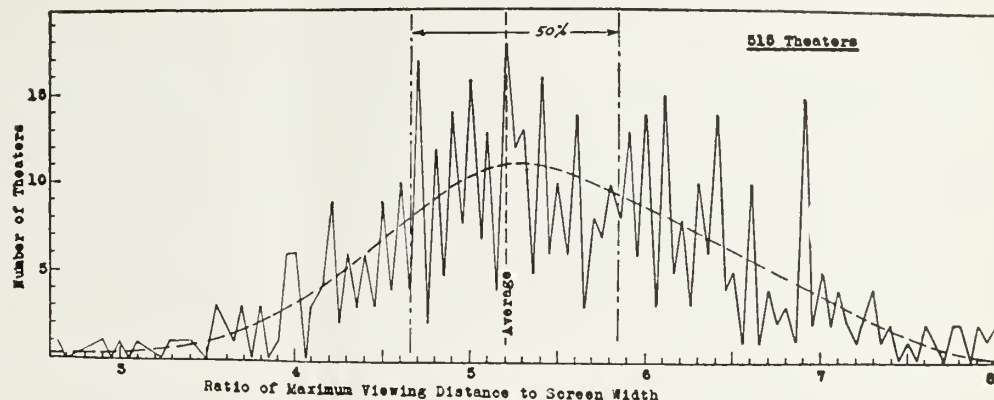


FIG. 2

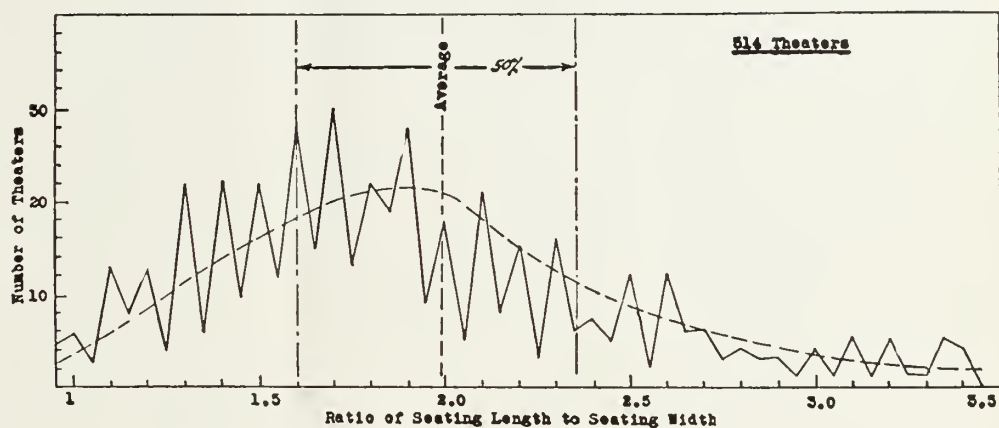


FIG. 3. Seating area characteristics.

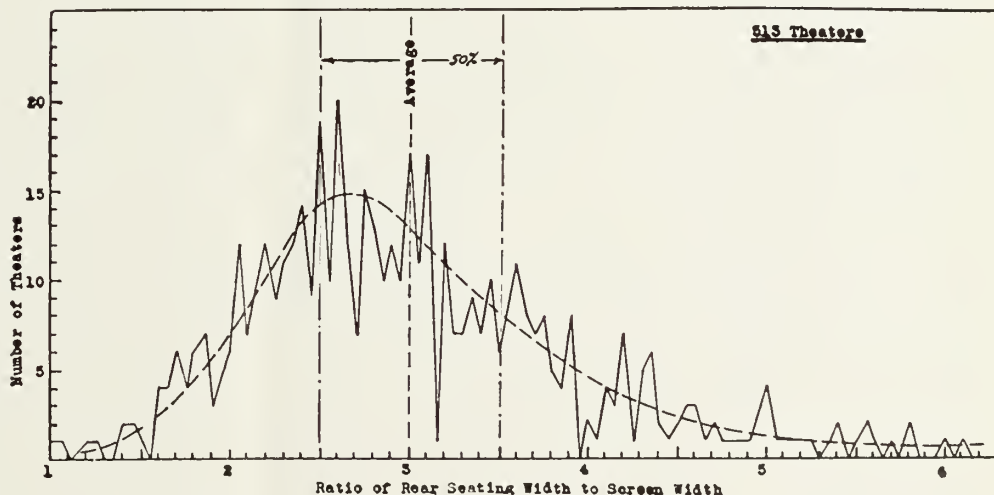


FIG. 4. Relation of seating width to screen width.

of proper motion picture presentation. Considering only theatres erected after 1930, percentage was 27.

A set of standard requirements for theatre construction could easily have limited these variations and thereby have benefited motion picture presentation greatly. As it is, however, there appears to have been considerable neglect, disregard, or ignorance of motion picture viewing principles in design of motion picture theatres. This is evidenced by fact that smooth broken curves, drawn through jagged graphs for purpose of roughly representing average tendencies, are amazingly similar in general shape to well known probability curve. Inference follows, therefore, that the fulfillment of satisfactory viewing conditions in theatres, up to the present, has been primarily a matter of chance and not of

intention. Perhaps this disregard of proper motion picture design principles may be attributed to fact that motion picture theatre design has evolved from stage-theatre form, which is unfortunate since basic form required for stage theatre is quite different from that required for motion picture theatre.

Since the motion picture has become sole, or, at least, most important means of entertainment in almost all theatres where motion pictures are exhibited, it is important that recommended practices for motion picture theatre design be formulated. Such recommended practices could be followed as guides not only in designing new theatres but in remodeling and re-equipping existing theatres. They would indicate ideal conditions desirable in new structures and variations from ideal that would be tolerable, if

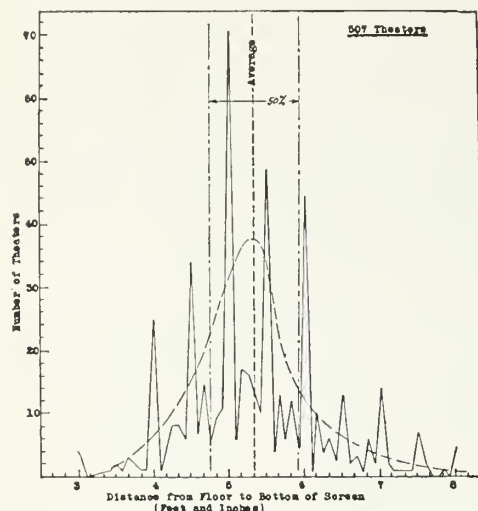


FIG. 5. Location of screen above floor of auditorium.

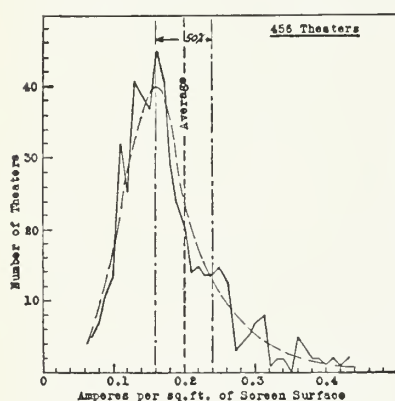


FIG. 7. Projector arc current.

indicating best possible use of poorly proportioned as well as more correctly proportioned plots. This is necessary because street plans and excessive land costs produce many variations in ground plot shapes.

Laws governing theatre construction in many

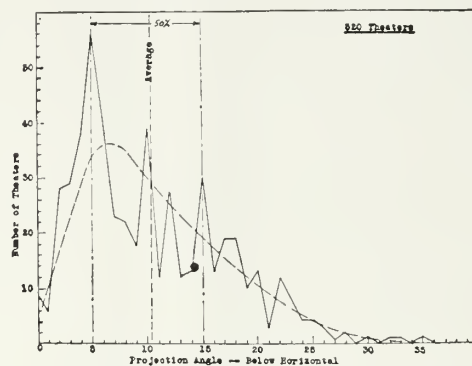


FIG. 6. Projection angle.

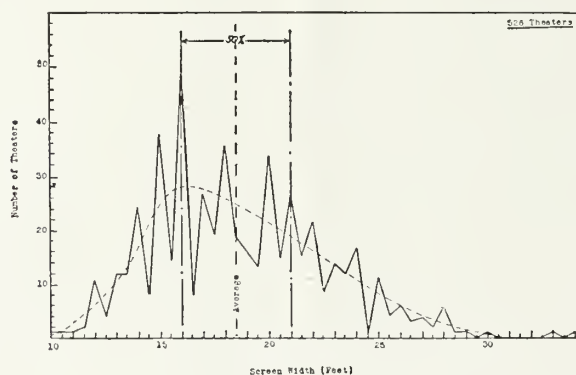


FIG. 8. Chart of screen widths.

necessary, in correcting undesirable conditions in existing structures. To be of practical use these standards should take cognizance of such physical conditions as

- regular and emergency audience "traffic";
- practical structural possibilities;
- shapes of ground plots; and
- limitations of motion picture film and equipment.

Special attention should be given to all such matters in order that proposed practices may be applied in a sufficient number of instances to assure raising general quality of motion picture presentation. Survey clearly indicates that practical limitations are not only causes of existing undesirable conditions, but that there has been almost complete lack of scientific planning of motion picture structure. Proper relative importance can, of course, be given to practical considerations; but, at the same time, all possible importance must be assigned to design principles based upon scientific planning.

Ideal motion picture theatre would be one that contained maximum number of desirable seating positions per cubic foot of structure. In many instances where shape of ground plot, or laws governing exit facilities, etc., have been such as would assist in building satisfactory theatres, there have been no design principles or recommended practices available to guide designers. In other instances where conditions, to begin with, were not so fortunate, poor proportions of ground plots or restrictions of building laws led to erection of motion picture theatres most unfortunate in design. Therefore, any recommendations of this Committee should include recommendations instances require that aisles, passageways, and exit doors be so located as to cause a loss of valuable seating area. These laws have been made with little regard for their effect upon the proper functioning of theatre from the standpoint of motion picture presentation. Proposed prac-

tices for theatre construction must therefore indicate placement of traffic areas where they will diminish effective seating area least. They should also indicate to governing authorities wherein their existing safety laws may interfere with better design of theatres without prejudicing to any extent safety considerations upon which laws originally may have been based.

With modern fireproof and fume-proof construction employed for projection rooms, with elimination of stage scenery and excess draperies, and with generally fireproof nature of entire theatre building, a new approach may be made to the question of emergency exit requirements. This Committee now includes a theatre architect and a state official on theatre construction inspection. In addition, other architects and governing authorities are being invited to supply such information to Committee as will make it possible to submit final findings as a guide to be used by all states and municipalities in writing laws relating to motion picture theatres. It is opinion of Committee that all motion picture theatre construction should be under guidance of competent theatre architects.

In addition to improving general quality of motion picture theatre design, structural stand-

ards will assist a great deal in clarifying many of motion picture equipment problems. For example, light-producing sources, motion picture screen characteristics, and sound systems might be classified according to their ability to fulfill requirements of definite types of theatre structure.

Basic design of motion picture theatre depends more than anything else upon necessity of satisfactorily viewing picture. The factors involved are:

- (1) Picture detail.
 - (a) Screen size in relation to viewing distance.
 - (b) Screen brightness.
- (2) Obstruction of view.
- (3) Distortion of picture.
 - (a) In projection.
 - (b) In viewing.

Figs. 2-9 and Table I have been computed from data provided by the returned survey charts. Figs. 2 and 7 will be especially helpful in studying picture detail problem. Fig. 5 is intended for use in determining area of screen obstructed by heads of spectators. Figs. 3 and 4 indicate conditions controlling picture-image distortion due to viewing angles. Fig. 6 shows projection angle, another factor affecting picture-image distortion.

Survey indicates that seating capacities have steadily become smaller. Whereas 26 per cent of theatres surveyed, erected before 1930, have capacities of 1500 seats or over, only 10 per cent of the theatres erected after 1930 have capacities so great. Theatres of 2000-seat capacity and over, erected after 1930, amount to only five per cent of total.

Future recommendations should show disadvantages encountered when capacities of over 1500 seats are contemplated. A point to be noted in survey is that characteristics of theatres having capacities greater than 2000 seats do not fall within the 50-per cent group, indicating that an important percentage of seats in these large theatres are more or less subject to undesirable viewing conditions, and that best results in establishing standards of design will be attained if the seating capacities are assumed to be 1500 or less. This maximum applies to usual rectangular ground plan. Somewhat greater capacities may be possible in a trapezium-shaped ground plan.

Although screen-image size is related to maximum viewing distance, screen-image sizes in theatres covered indicate tendency toward sizes too small for given viewing distances. This may be due to general desire to avoid sufficient magnification to reveal film graininess and thereby assist in rendering seats closest to the screen undesirable. Fig. 8 shows that average screen-image is 18.5 feet wide, 50 per cent of the theatres surveyed having screen-images ranging from 16 to 21 feet wide.

Using average screen width of 18.5 feet (Fig. 8) and assuming this width represents maximum desirable magnification of 35-mm. film, approximately 800 seats can be arranged in a single tier. Should the maximum permissible magnification be assumed capable of producing an acceptable 25-foot screen image, a capacity of 1100 seats would be accomplished in a single tier. These capacities are arrived at by assuming, temporarily, averages indicated in Figs. 3 and 4. If second or upper tier of seats be employed in

TABLE I
Theatre Survey, Characteristics of Theatres

	Lower Extreme	Min.	50% of the Theatres Av.	Max.	Upper Extreme
Radio max. viewing dist. to screen width	2.60	4.65	5.20	5.85	8.00
Ratio seating length to seating width	0.90	1.52	1.98	2.35	3.50
Ratio rear seating width to screen width	1.00	2.50	3.00	3.50	6.20
Screen width	10'	16'	18'-6"	21	34'
Distance from floor to bottom of screen	3'-0"	4'-9"	5'-4"	5'-9"	8'-2"
Projection angle	0°	5°	10° 5'	15°	35°
Amperes (arc) per sq. ft. of screen surface	0.06	0.16	0.20	0.24	0.44

both 800- and 1100-seat instances, these capacities would be increased respectively to approximately 1200 and 1700 seats. These figures indicate reason for assuming that 1500 seats may be advisable maximum capacity.

While data shown in graphs do not determine, without further study, ideal theatre proportions and dimensions, they do, however, reveal conditions that may be regarded as at least tolerable. For example, conditions in theatres proportions and dimensions of which fall within 50-per cent group marked on charts may, for immediate practical purposes, be regarded as tolerable. Fig. 9 depicts these characteristics graphically. Figures shown should not be interpreted as representing any attempt on part of Committee, as yet, to fix maximum or minimum conditions; further analysis is required.

Considered from standpoint of visual aspects only, ground plan of a motion picture theatre is controlled, first, by ability of audience to see details of picture. This ability is determined by:

- (a) Illumination of screen;
- (b) Brightness contrast of the projected image;
- (c) How much image detail is to be discernable to spectator (art of cinematography is here the guiding factor);
- (d) Width of film, which controls maximum screen-image size.

Second, ground plan is controlled by area within which viewing angles afford an acceptably undistorted appearance of two-dimensional screen-image. (Tuttle, C.: "Distortion in the Projection and Viewing of Motion Pictures," *J. Soc. Mot. Eng.*, XXI (Sept., 1933), No. 3, p. 198.) Still another consideration in determining ground plan is that of choosing between a single tier of seats and a multilevel seating plan. Desire to obtain maximum number of seats on valuable ground area has usually been important reason for adopting upper-level seating schemes. Yet most plausible reason for multilevel seating is that excessive viewing distances can be avoided and minimum screen-image sizes can be used. Multilevel seating scheme would tend toward more squarely proportioned and smaller ground plan; whereas single-level seating plan tends toward elongated rectangular plan, and, naturally, larger ground area.

Ideal motion picture theatre form, considered from purely technical and artistic standpoint, may develop into form that may not in some instances fulfill all rigid requirements set forth for the commercial motion picture theatre; yet it is obligation of Society to indicate what would be the most desirable form of theatre, and all those who are concerned with design of theatres may adhere as closely to these recommendations as may be practically possible, in any case being sure to stay within limits set forth as tolerable.

Following principles determine characteristics of ideal motion picture presentation:

- (1) Minimum seating capacity, permitting minimum screen-image sizes.
- (2) Control of screen-image size, to avoid over-magnifying film graininess.
- (3) Minimum viewing distances, to enable greater cinematographic use of screen-image.
- (4) Maximum seating capacity possible while still adhering to requirements of (2) and (3) above.
- (5) Maximum number of seats within an area from which screen-image will not appear objectionally distorted.
- (6) Floors or steps properly graded, to afford unobstructed view of screen-image from every seat.
- (7) Maximum screen brightness, using minimum of electric power.

It is intention of Committee to give further detailed study to problems of picture detail, screen brightness, cinematography, magnification ratio, image distortion, and obstruction of screen-image. By considering factors revealed by sur-

vey and other studies it will be possible to formulate definite recommendations for standards for motion picture theatre design.

Report of Sub-Committee on Projector and Screen Illumination

For a long time Projection Practice Committee, through its sub-committees, has been working on the problem of discovering meters that could be used in the theatres for measuring light from projector incident upon and reflected from screen. Such meters should be simple to operate and relatively low in cost, in order to be within means of all theatres. Meters have been available in past by means of which such measurements may be made, but in all cases meters were very high-priced and required for their operation men specifically trained in art of handling meters.

Some progress has been made, however, in that meter is now available by means of which incident light may be measured, but no report can be given at this time as further studies are being conducted with meter with regard to its use in connection with screens of various types and under various circumstances. Very little progress can be reported, however, with regard to measuring the reflected light, so that for present no means are available for determining reflection coefficient of screen other than by using specially measured and graded samples of paper such as accompanied the report of the Projection Practice Committee in the June, 1933, issue of the *Journal*.

Committee plans to continue its work on screen illumination during coming months, and hopes to render a more definite report at a later time.

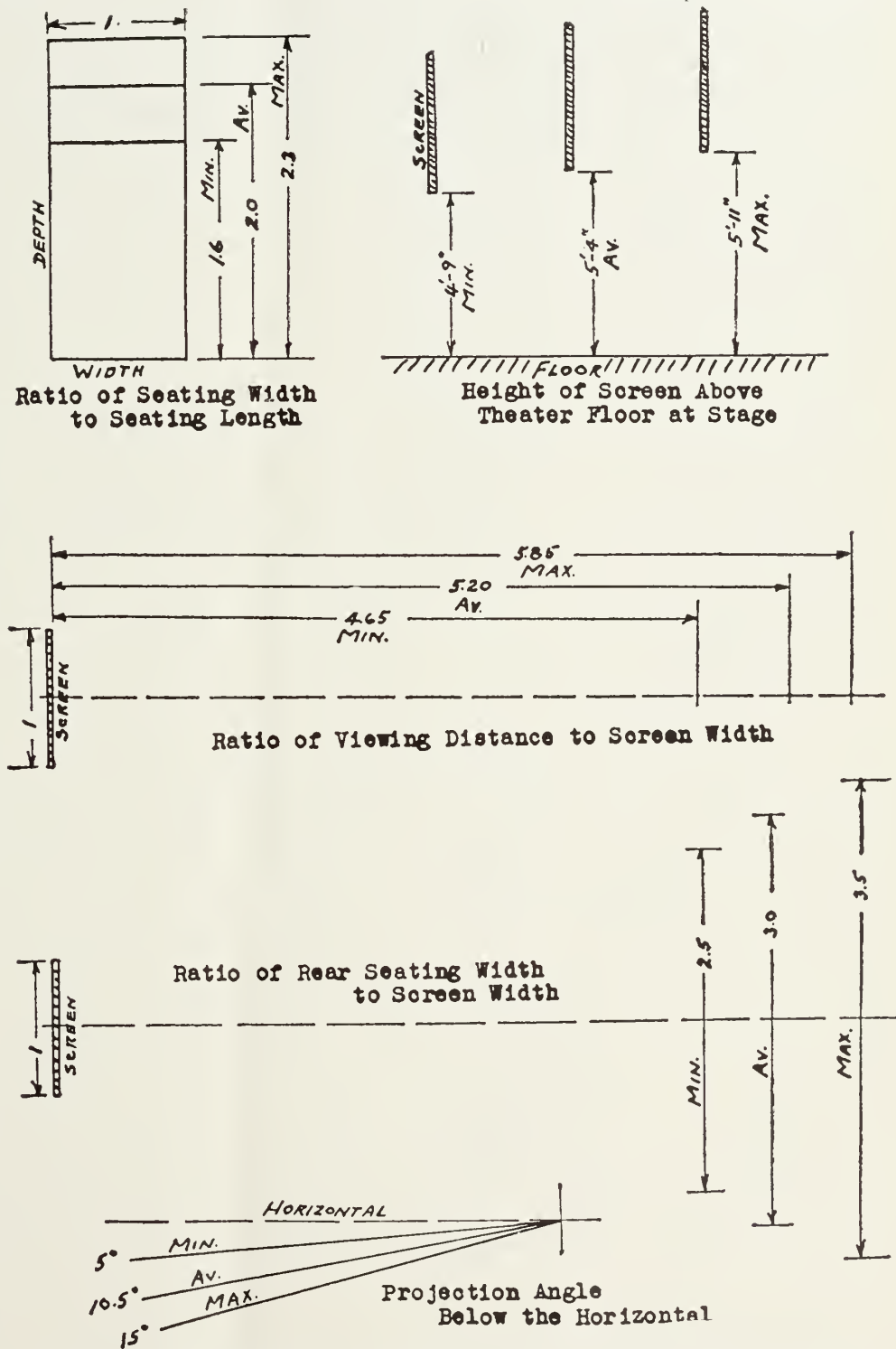


FIG. 9. Characteristics of Theaters Falling within the 50% Group.

CLASSIFIED DIRECTORY

Camera-Accessory Dealers

- Camera Equipment, Inc.**
1600 Broadway, N. Y. (Circle 6-5080)
- Camera Supply Co.**
1515 N. Cahuenga, Hollywood. (GLadstone 2404)
- Faxon Dean**
4516 Sunset Blvd., Hollywood
(Morningside 11838)
Night—Hollywood 1271)
- Hollywood Camera Exchange**
1600 N. Cahuenga, Hollywood.
(Hollywood 3651)
- Motion Picture Camera Sup. Co.**
723 Seventh Avenue, N. Y.
(BRyant 9-7754)
- Morgan Camera Shop**
6305 Sunset Blvd., Hollywood.
(GLadstone 3101)
- Pacific Cine Films**
1454 N. Gardner Ave., Hollywood
- Hollywood Film Enterprises, Inc.**
6060 Sunset Blvd. (Hl. 2181)

Camera-Accessory Mfrs.

- Bell & Howell Co.**
1848 Larchmont Ave., Chicago.
Hollywood, 716 N. LaBrea.
(WYoming 3134)
- Duplex Cinema Equipment Co.**
4572 Santa Monica Blvd., Hollywood.
(Morningside 14717)
- Eastman Kodak Company**
Rochester, N. Y.
Hollywood, 6706 Sta. Monica.
(HEmpstead 3171)
- Kalart Company**
58 Warren St., New York.
Hollywood, Taft Bldg.
- Devry Corporation**
111 Armitage Ave., Chicago.
- Thalhammer Company**
121 S. Fremont Ave., Los Angeles.
- Mitchell Camera Corp.**
665 N. Robertson Blvd., West Holly'd.
(OXford 1051)
- Sun Ray Photo Company**
138 Centre Street, N. Y.
- Moviesound Company**
Jamaica, L. I., New York.
- Commercial Camera Co.**
1033 No. La Brea Ave., Hollywood.
(H.E. 8110)
- Fried Camera Company**
6154½ Santa Monica Blvd., Hollywood.
(H.E. 6716)

Camera Rentals

- Faxon Dean, Inc.**
4516 Sunset Blvd., Hollywood.
(MO. 11838)
- Kruse Camera Rentals**
1033 N. Cahuenga Blvd., Hollywood.
(Hillside 4464)
- Landers & Trissel, Inc.**
6313 Sunset Blvd., Hollywood.
(HEmpstead 2277)

Camera Cars

- Jack O'Hare**
5418 Sierra Vista, Hollywood.
(HO. 9862)

CHEMICAL ENGINEERING

- ALLISON, D. K.**
9308 Santa Monica Blvd., Beverly Hills.
(WOodbury 62777)

Color Prints

- Ruthenburg Color Photography Co.**
4961 Sunset Blvd., Hollywood.

Film

- DuPont Film Mfg. Corp.**
Parlin, N. J.
- Smith & Aller, Ltd.**
6656 Santa Monica Blvd., Hollywood.
(HO. 5147)
- Eastman Kodak Company**
Rochester, N. Y.
- J. E. Brulaton, Inc.**
6706 Santa Monica Blvd., Hollywood.
(Hl. 6131)
- Agfa-Ansco Corp.**
Binghamton, N. Y.
- C. King Charney, Inc.**
6372 Santa Monica Blvd., Hollywood.
(HO. 2918)
- Hollywood Ray Film Co.**
P. O. Box 3056, Hollywood.

Filters

- Scheibe, George H.**
1927 W. 78th St., L. A. (TW. 2102)
- Harrison & Harrison**
8361 Santa Monica Blvd., Hollywood.
(GR. 6021)

For Sale or Rent—Cameras

FOR SALE OR RENT—Mitchell and Bell & Howell silenced cameras, follow focus. Pan lenses, free head, corrected new aperture. Akeley, De Brie, Pathe, Universal, Prevost, Willart, De Vry, Eyemo, Sept, Leica. Motors, printers lighting equipment. Also every variety of 16 mm. and still cameras and projectors. B & H Cameras with old type shuttles silenced \$150. Bipack magazines and adaptors for color. Everything photographic bought, sold, rented and repaired. Send for our bargain catalogue. Hollywood Camera Exchange, 1600 Cahuenga Blvd. Phone HO. 3651. Cable, Hlocamex.

ONE 70 mm. FEARLESS silenced camera; two 1000 ft. magazines; 50, 75 and 100 mm. F2 lenses. This equipment is in perfect mechanical condition. Write or wire.

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BELL & HOWELL SINGLE SYS-TEM, COMPLETE; rebuilt B & H sound printers; rebuilt Duplex sound and picture printers; 200 ft. Stinemann developing reels; used measuring machines. Complete Akeley camera equipment. Akeley 1000-ft. magazines, synchronous camera motors. Motors, sunshades, finders, lenses and all accessories. Write, wire or cable.

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Cable: Cinecamera

BELL & HOWELL 170° CAMERAS—High speed shuttles—high speed gear boxes—400 and 1000 foot Bell & Howell magazines—Bell & Howell tripods—motors. Mitchell silenced cameras. AKELEY and DeBRIE CAMERAS. Akeley motors. High speed motors. Sunshades, lenses and finders. Write or Wire

CAMERA EQUIPMENT, INC.
1600 Broadway New York City
Tel. Circle 6-5080 Cable: Cinequip

Bell & Howell silenced camera outfit \$1150. Metal DeBrie Camera—4 lenses, magazine, complete \$450. 400 ft. Newman Sinclair camera—motor 30.50 and 20 inch lenses—tripod—costs \$2500. for \$650. Camera-Mart, Inc., 70 West 45th Street, N. Y. C.

ONE RABY BLIMP, new—never used. Will fit standard or NC Mitchel cameras. Price \$500. Landers & Trissel, 6313 Sunset Blvd., Hollywood.

COMPLETE AKELEY OUTFIT, EXCELLENT CONDITION, 14 inch, 6 inch, 4 inch, 3 inch matched pair, 40 mm. matched pair, and 40 mm. f:1.5 lenses, five magazines, carrying case and tripod, \$900. C. W. Herbert, 315 West Lewis St., Livingston, Montana. (This equipment can be seen at National Cine Laboratories, 20 East 22nd St., N.Y.C.)

Film Editing Devices

- Moviola Company**
1451 Gordon St., Hollywood.
(Hollywood 9440)

For Sale—Miscellaneous

LIKE NEW BELL & HOWELL Five-Way Sound Printers and Sound Moviolas. Also Light Testers at reasonable prices. Hollywood Camera Exchange, 1600 Cahuenga Blvd., Hollywood. Cable, Hlocamex.

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- Brown-Caldwell, Engravers**
1220 Maple Ave., L. A. (Prospect 1044)
- Holly-Beverly, Typewriters**
1649 Wilcox, Hollywood. (GL. 1590)
- Dr. Llewellyn J. Price**
6331 Hollywood Blvd. (H.E. 0637)
- Underwood Elliott Fisher Co.**
1557 No. Vine St., Hollywood.
(GLadstone 1696)
- Sardi's Restaurant**
6253 Hollywood Blvd. (HO. 2131)

Lenses

- Goerz American Optical Co.**
317 East 34th St., N. Y.
- Bell & Howell Co.**
- Herron Optical Co.**
705 W. Jefferson Ave., Los Angeles.
(PR. 3822)

Lighting—Electrical Equipment

- Bardwell & McAlister**
7636 Santa Monica Blvd., Hollywood.
(Hollywood 6235)
- General Electric Company**
Nela Park, Cleveland, Ohio.
- Mole-Richardson, Inc.**
941 N. Sycamore, Hollywood.
(Hollywood 5838)
- National Carbon Company**
Carbon Sales Div., Cleveland, Ohio.
- Union Carbide & Carbon Corp.**
Cleveland, Ohio.

Manufacturing Machine Shops

- Cinema Arts-Crafts**
814 N. Fairfax, Hollywood. (H.E. 1984)
- Duplex Cinema Equipment**
4572 Santa Monica Blvd., Hollywood.
(MO. 14717)
- Art Reeves**
7512 Santa Monica Blvd.
- Studio Equipment Co.**
1123½ Lillian Way, Hollywood.
(GRanite 6844)
- Fred Hoefner**
5319 Santa Monica Blvd., Hollywood.
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- ROBERT W. FULWIDER**
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- Motion Picture Process Corp.**
1117 No. McCadden Pl., Hollywood.
(Temp. Phone Hillside 8179)

Projection

- International Projector Corp.**
88-96 Gold St., N. Y.

Screens

- Flat Light Screen Co.**
6233½ Santa Monica Blvd., Hollywood
(Hl. 9109)

Sound Equipment

- Blue Seal Sound Devices**
723 7th Ave., N. Y.
- Canady Sound Appliance Co.**
19570 S. Sagamore Rd., Cleveland, Ohio.
- C. R. Skinner Mfg. Co.**
290 Turk St., San Francisco.
(ORDway 6909)
- Glen Glen Sound Co.**
4516 Sunset Blvd., Hollywood.
(OL. 2131)
- Art Reeves**
7512 Santa Monica Blvd. (Hl. 1492)

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FIRST among this 16 mm. Ciné-Kodak's many features is its 3-second loading—with films that come pre-threaded in light-tight metal magazines which slip into the camera.

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LENS VERSATILITY—the ultra-fast Kodak Anastigmat *f*.1.9 lens is instantly interchangeable with the six accessory telephotos and one wide-angle lens available.

POCKET SIZE—Its sturdy case of die-cast aluminum, finished in pin-grain leather and chromium trim, measures only 6¼ by 4 by 2 inches. Carrying handle, incorporating finder system serving all eight lenses, folds flat when not in use.



You slip the Focusing Finder into the film chamber of the Magazine Ciné-Kodak just as you would a film magazine.

THREE SPEEDS—16, 32 and 64 frames per second. Smooth-running motor supplies power enough for extended scenes—and automatically cuts off when rewinding is needed.

FOCUSING FINDER—shown above, right—slips into the camera and shows exact field covered by any lens, and a magnified section of field for critical focusing. \$20.

COMPARTMENT CARRYING CASE—shown above—holds camera, extra magazines, lenses and filters, \$27.50.

AND FOR PROJECTION—Kodascope Model G—Eastman's new projector with 2-inch *f*.1.6 lens and 500-watt lamp for showing 16 mm. movies at their best. \$123.45.

Ciné-Kodaks, Kodascopes, and Ciné-Kodak Film are all Eastman-made, designed to work together and backed by dependable, world-wide Eastman service.

Magazine Ciné-Kodak, with Kodak Anastigmat *f*.1.9 lens, \$125

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Vol. 10

No. 7



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PHOTOGRAPHY

400mm Telyt Lens

WITH TELEPHOTOGRAPHY BECOMING more and more popular today with professionals, newsmen, and advanced amateurs making considerable use of long focus lenses to make close-up photographs of things happening at a distance, the Leica camera now enters the ranks of these super-sport cameras with a new Telyt 400 mm. lens. This lens has an aperture of F:5 and is focused by means of a mirror reflex housing which gives ground glass focusing up until the moment of exposure.

The new lens has a focal length 16 times greater than the short side of the 1x1½-inch Leica negative. If one wanted to have a similar lens on a 5x7-inch camera, it would be necessary to have a lens with a focal length of 80 inches, or 6 feet, 8 inches, so big that it would require transportation by truck!

The 400 mm. Telyt lens, when mounted on the Leica camera with mirror reflex housing, measures 12¾ inches from the back of the camera to the front of the lens (when focused at infinity), and the entire outfit weighs 7 pounds.

For maximum ease of operation, the new 400 mm. lens may be mounted on the Leica Gun (INT. PHOTOG., Tradewinds, March, 1938), combining rapid winder action with complete freedom of action for it need merely be mounted on a tripod with a ball jointed head. Thus, it may instantly be swung into any position desired without loss of time in tightening the tripod screw every time it is moved—for, since the butt

of the gun rests against the shoulder, it may be held steadily on the subject.

Zephyr and Perfex

TWO NEW CANDID CAMERAS competing in the "under \$30" field are the Zephyr, manufactured by Photographic Industries of America, New York City, and the Perfex, manufactured by Candid Camera Corp. of America, Chicago. The latter sells at \$25 with f:3.5 lens and the former at \$22.50 with f:3.5 lens, and at \$29.50 with f:2.9 lens.

Both cameras feature focal plane shutters with speeds to 1/500. The Perfex features a built-in exposure meter as well as a built-in range-finder. Carrying cases and other accessories are part of the two new lines.

A New "Baby Keg"

Simplicity and lightness are the keynotes of a new 500-watt unit introduced by Bardwell & McAlister, Inc., Hollywood lighting equipment manufacturers. Following the general lines of their well-known Keg-Lite, this "Baby Keg" weighs only 28 pounds complete with double riser stand. For break-down, the head only weighs 16 pounds, the stand 12 pounds. This lamp, light, yet of sturdy construction, is another valuable contribution to the small spot field for studio and professional use.

The popular B&M quick-focusing device has been further simplified. A lever arm, protrud-

ing from both front and rear, is moved from side to side for focusing spot to flood. So simple is this mechanism that a high lamp can be focused by merely exerting a pressure against the protruding lever.

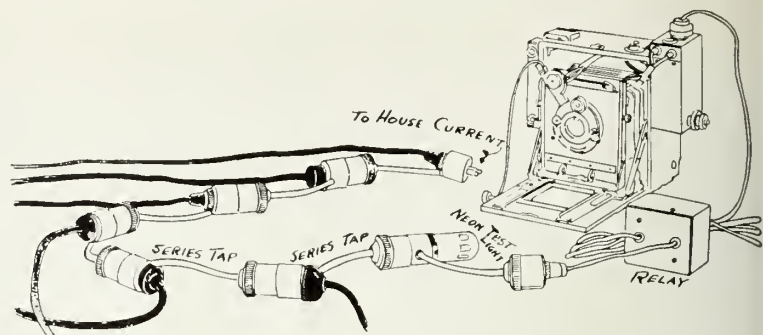
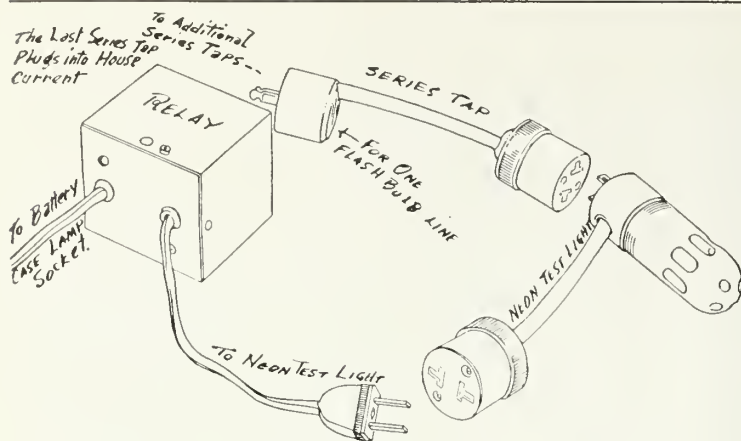
The lamp can be furnished with either pre-focus or medium bipost sockets. Both types of socket are porcelain base, insuring against deterioration from heat.

A short focus six-inch diameter Fresnel lens combined with a pre-focused high reflecting mirror gives great efficiency in light output.

The standard Keg-Lite lines and ventilation incorporated in this lamp make for longer globe life as well as coolness of operation.

16mm Supreme

To users of 16 mm. film with the negative-positive process Agfa's fast Academy Award winning Superpan Supreme is now available in 100-ft. lengths in 16 mm. negative form. Superpan Supreme may be used with one full lens stop less exposure than that necessary for 16 mm. F. G. Superpan which it replaces, or for ordinary supersensitive type films. Although speed is great, grain size is extremely small and grada-



The new Kalart Multiflash handles 20 bulbs.

tion is more brilliant than Superpan formerly supplied. Protection against halation is provided, and a coating over the emulsion protects it from abrasion marks.

Kalart's Multiflash Unit

PHOTOGRAPHERS SHOOTING STILLS in color will be interested in the new Series 110-V Kalart Multiflash Unit, which will flash as many as 20 bulbs in synchronism with the shutter at all shutter speeds, when used with the Micromatic Speed Flash. Lamps may be placed at a distance from the camera and arranged to obtain a variety of lighting effects. The unit consists of a specially designed electrical relay which will operate from either the 4½-volt or 9-volt battery case, standard with the Micromatic Speed Flash. This relay will close the 110-volt circuit to the flash bulbs which are connected in series by means of a specially designed and wired series connectors.

The complete equipment for this type of flash work, which is invaluable in making color shots particularly, consists of the Multiflash relay set-up, which plugs into the Kalart battery by means of a six foot extension cord; and attached to the relay is a neon test light.

As illustrated on Page 2, the complicated setup can be handled simply by the photographer or his assistant, once its arrangement is mastered. The neon test light assures a full flash from all bulbs when the release is tripped.

The operation of the Multiflash is such that when the Synchronizer switch is closed, the battery from the Synchronizer outfit will operate the relay switch, which in turn passes house current through the flash bulbs. Only one flash bulb may be used in connection with each series tap and when the entire circuit is properly plugged into the house current, then only does the neon bulb glow.

Kalart is marketing the Multiflash relay unit at \$22.50 with one series tap and the neon test light; and additional taps cost \$2 each.

Eastman Super Kodak

AUTOMATIC ADJUSTMENT according to the light conditions to give a perfect exposure of the scene before it, at snapshot shutter speeds from 1/25 to 1/200 second, is the feature of Eastman's new Super Kodak Six-20, through coupling a photo-electric cell with the lens diaphragm. When the picture is taken the Super Kodak lens automatically stops down to exact aperture required for perfect exposure at the selected shutter speed.

The sensational new camera incorporates a range finder of radically new design, mechanically coupled to the focusing mount of the lens and combined with the direct eye-level view finder in a single eyepiece. Double exposures are automatically prevented by a device which precludes

re-tripping of the shutter until the film-winding lever is operated. An automatic visual warning signal indicates when film should be wound to the next frame. Winding of film automatically re-sets shutter for the next exposure. The shutter carries slow speeds of 1/10, 1/5, 1/2 and 1 second, as well as snapshot speeds from 1/25 to 1/200 second. A built-in self-timer device offers a delayed action interval of approximately 12 seconds. A galvanometer dial on the lens housing permits selective readings of light and shadow areas in a scene, as with a photo-cell exposure meter, and for special effects the lens diaphragm may be adjusted by hand.

The Super Kodak's body, back, and range-view-finder housing are die-cast of special aluminum alloy for maximum strength plus lightness. Beaded borders, finished in polished chromium, contrast with the larger satin-finished metal areas. The body covering is fine-quality black morocco-grain leather, and lugs for hand or neck straps are provided.

Slight pressure on the bed release allows the user to draw the camera front forward until it locks in picture-taking position. Front extension struts of new design support the lens and shutter assembly with girder-like rigidity.

When the camera is held for a vertical picture, the range-finder is at the top. Just below it is a multiple collective lens, with the sensitive photo-cell behind it. This is so calculated that it covers the exact field of the camera lens—an important feature, since it causes the photo-cell to react only to the light conditions in the picture scene.

At the moment the shutter is released, the photo-cell actuates the galvanometer in the lens housing, and the diaphragm adjusts to the correct aperture at the chosen shutter speed to produce a technically correct negative.

The shutter speed scale is seen through a window on top of the hood which projects over the bellows and lens. Adjustment is made by turning a knurled knob at the left of this hood. When the shutter is tripped, a red warning dot appears in this window to indicate that film should be wound.

Despite all these operating conveniences and technical safeguards, the new camera is approximately the same size as a conventional Six-20 Kodak. It takes eight pictures, 2¼x3¼ inches, on a roll of Six-20 film, and its lens is a newly calculated Kodak Anastigmat Special f:3.5, closing down to f:22.

Retail price of the Super Kodak Six-20 is \$225. It will be in the hands of dealers some time this month.

B & H Expands Exakta Sales

Bell & Howell Company last month expanded its sales representation on the Exakta line of still cameras manufactured by Ihagee Kamera-

werk, Dresden. Starting more than a year ago with exclusive sales rights in eleven western states (California, Oregon, Washington, Nevada, Idaho, Utah, Arizona, New Mexico, Colorado, Wyoming and Montana) the new expansion extended the B & H sales representation of Exakta cameras to five additional states (North Dakota, South Dakota, Nebraska, Kansas and Oklahoma).

Bell & Howell has been experimenting for some time in the supplemental use of "stills" with motion pictures for both personal and educational purposes.

The Exakta line of cameras are practical for those wishing to take black-and-white or natural color stills mainly for projection purposes, with the Kine 24x36 mm. Exakta, using multi-exposure 35 mm. recommended. The V.P. 4x6.5 cm. Exakta is recommended to those desiring mainly to obtain stills for printed enlargement.

The new plate-back model Exakta now distributed by Bell & Howell in the west and by Photo Marketing Corporation of New York in the east, is fully illustrated on Page 4 of this issue.

Willo Contact Printer

A NEW WILLO CONTACT PRINTER, all-metal and selling at \$8, now is available from Willoughby's, New York camera supply house. Among its features are: two sources of printing light; takes two 40- or 60-watt lamps; red pilot lamps always on for composition of negative; automatic on and off switches; thorough ventilation; four masking blades one inch wide, which swing upward, permitting movement of film without scratching; convenient hold-downs; heavy felt on platens; positive contacts between paper and negative; prints up to 5x7; takes paper up to 9x12; etched scale shows size of print and margin.

Protective Paper Box

AN INGENIOUS enlarging paper box, which will not permit thoughtless unintended exposure in the dark-room is now available from E. Leitz, Inc. It has a spring actuated lid that snaps shut and protects the contents of the box against light as soon as the band is removed. The box holds several sizes of paper. It saves paper, time and trouble by eliminating fumbling about for enlarging paper in the dark-room.

Contax 180 mm Lens

FROM ZEISS COMES a new Sonnar f:2.8, 180 mm. lens with reflex Flektoscope and chest support for use with the Contax. The lens unit sells for \$400 and the chest support costs an additional \$16. Primarily intended for high speed sports photography or nature studies of birds

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

Editor, ED GIBBONS; Managing Editor, HERBERT ALLER; Art Editor, JOHN CORYDON HILL;
Business Manager, HELEN BOYCE.

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J. N. A. HAWKINS, PAUL R. CRAMER, WILLIAM COMYNS.

VOL. X.

Contents for August, 1938

No. 7

On The Cover: Nan Grey, Universal starlet, photographed by Irving Lippman, stillman member of Local 659, IATSE, while on loanout to Columbia. Miss Grey is the daughter of Eddie Miller International Representative of the IATSE & MPMO, with headquarters at Houston, Texas.

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The Story of Kalart

News of the Month Pages 12 to 31

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Lighting-Sets

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Patents

Projection

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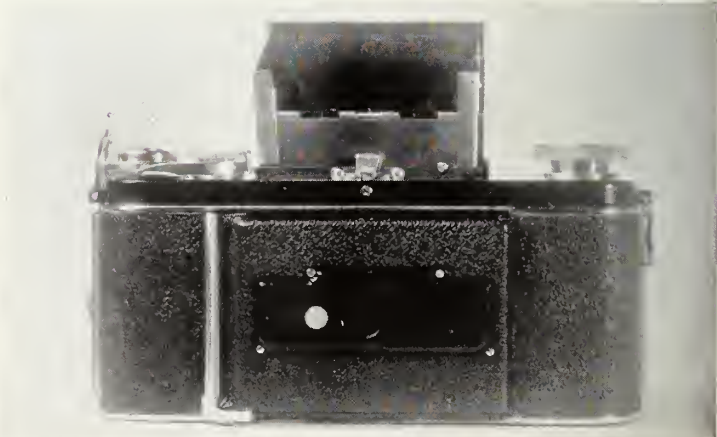
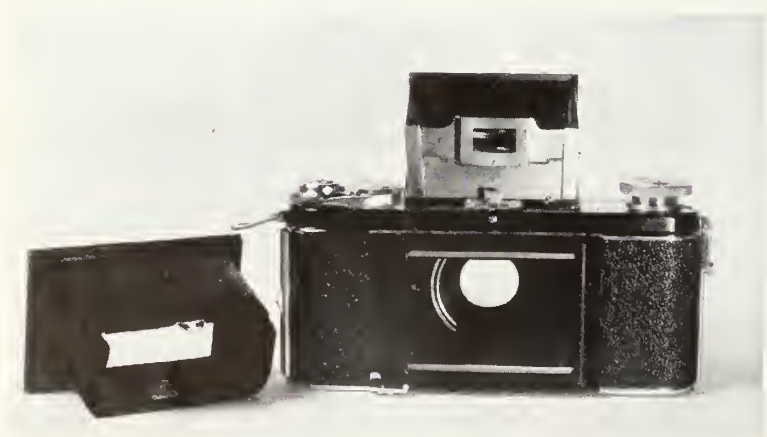
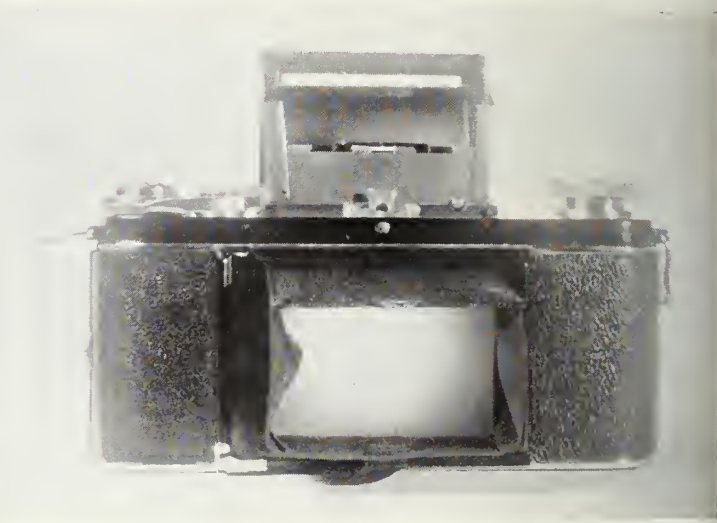
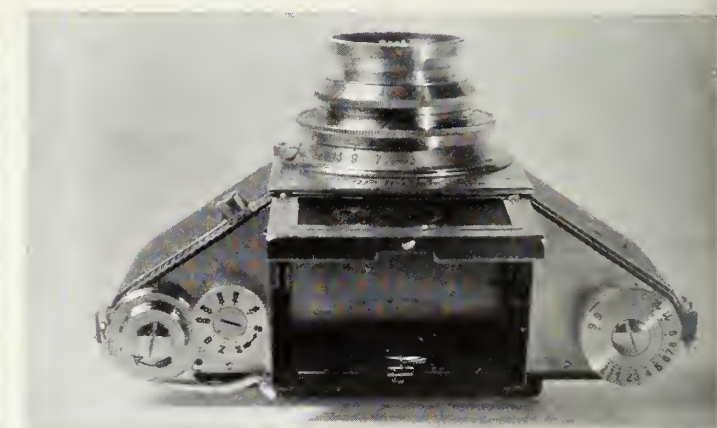
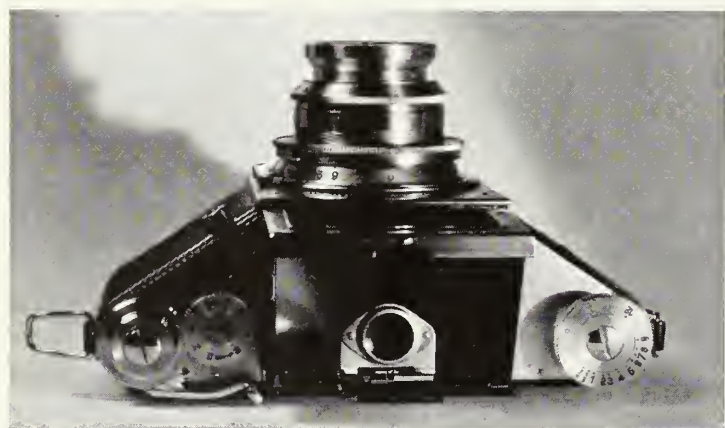
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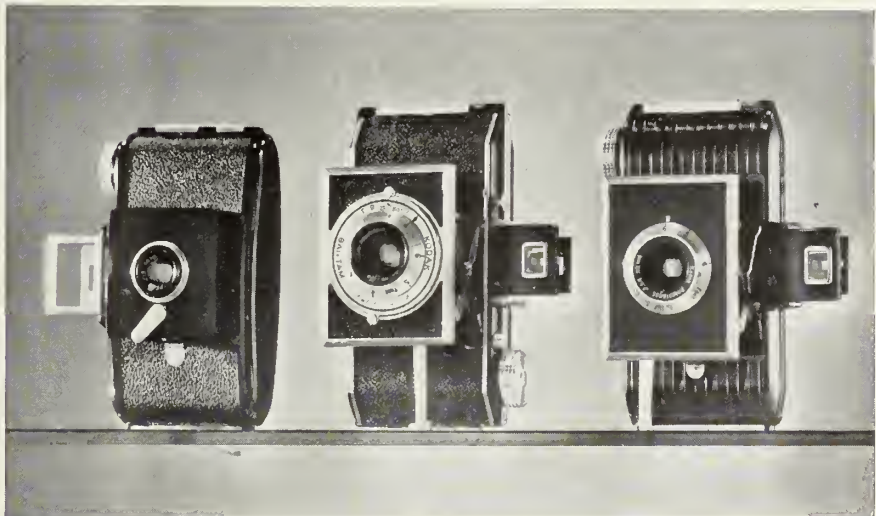
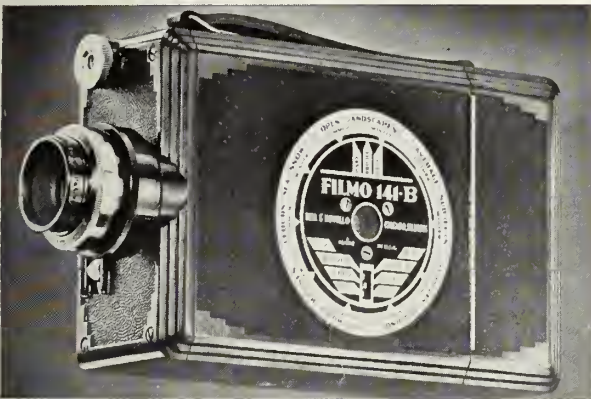
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Another self-explanatory preview layout by Paul Allen—the new plate back model Exakta.



and animals in their natural haunts, the reflex principle of the setup permits focusing and viewing the subject simultaneously. The focusing eyepiece incorporates a five times magnifier. Exposure is made by cable release, displacing a mirror, which in turn actuates the shutter.

Top Left: the new Zeiss sport lens (Page 2, Column 3); Top Right: the new automatic shutter controlled Eastman Super Kodak (Page 2, Column 1); Lower Left: the new Filmo 114-B, described in detail in last month's Tradewinds Lower Right: the three models in Eastman's new series of Kodak Bantams, prices up to \$27.50.

B & L Slide Viewer

A NEW FILM SLIDE VIEWER, finished in either brown, green, or black, has just been completed by the Bausch & Lomb Co. for the users of miniature cameras. The unit is sturdily constructed with an excellent optical and illuminating system. The ground glass diffusing screen is approximately two inches square, permitting showing of all popular miniature sizes, in black-and-white, or colored positives. The three-inch precision lens produces a crisp enlarged image of the film and creates an illusion of depth. The Film Slide Viewer operates on 110-volt A.C. or D.C. and uses a standard 15-watt Mazda bulb. The housing is well ventilated and the bulb is small to avoid harming slides or film.

LABORATORY

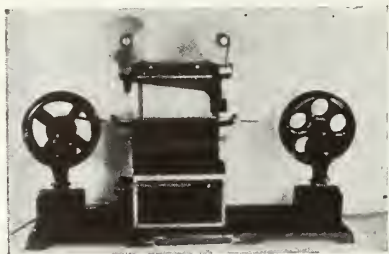
Fried Continuous Printer

A NEW MODEL DB of the Fried 16mm. Continuous Printer is now available. It is a 16mm. bench model machine incorporating the necessary features of precision construction; accurate control and efficient operation. It is designed to print sound track as well as picture. A small shifting lever permits the opening of either sound or picture aperture for printing. Operating speed is 40 ft. per minute.

Extreme care has been taken to avoid frictional

contact between film and the mechanism. The plating of aperture, pressure, and stripper plates with hard chrome finish provides an ideal smooth wear-resisting surface protecting the film from injury.

In operation this printer is semi-automatic with respect to printing light control. In order to compensate for the different densities of consecutive scenes the negative film is notched in the margin at the proper point for an effective change of light. As the scene passes the printing aperture, the notched film establishes an electrical contact which in turn actuates an electro-mechanical shutter. This affords an instantaneous change in the volume of printing light. The necessary changes are predeter-



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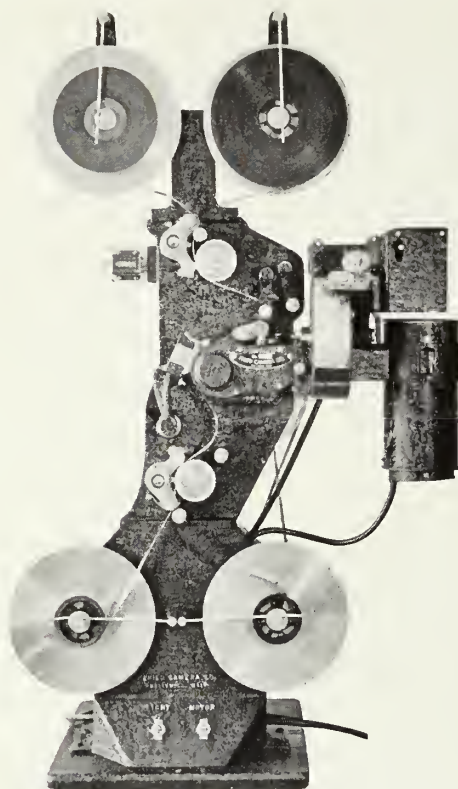
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Fried continuous printer.

mined by the operator. The setting of the shutter is always one step ahead of the actual operation. The manufacturers claim that the Fried Shutter Control is distinctly superior to any method of light change which varies the resistance in the

printing light circuit, asserting that the latter method is slow in action and materially changes the actinic value of the light.

Duplex Printer Model

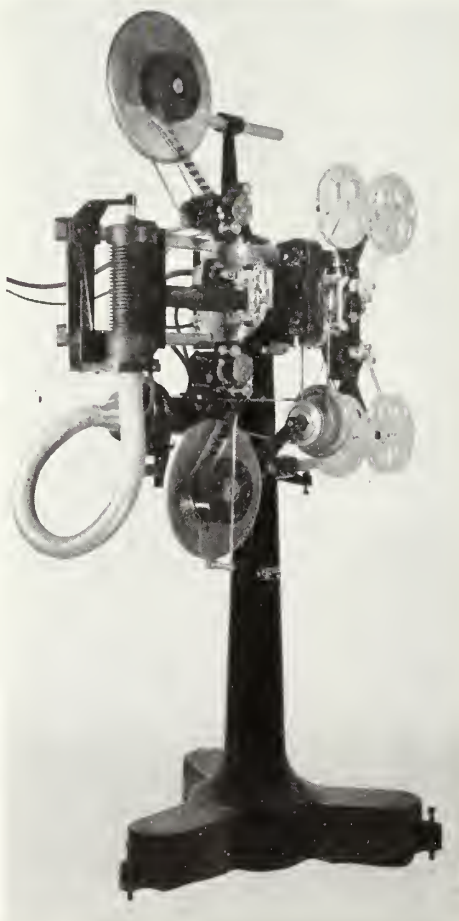
LATEST MODEL DUPLEX optical reduction printer model features the new camera-style movement with pilot pins and pressure pad, which release for registration and contact. The new optical printers from the Hollywood firm are available in either the single or double model. The double model consists of two machines mounted on one base and pedestal. The hand-dissolving shutter, which may be locked in any desired position, is extra equipment, as is also the new type unlimited scene, fully automatic light change. The light change operates in the same manner as in the new Duplex Standard Automatic Printing Machine.

Double pulleys for the V-belt drives allow a rapid change in speed and unless otherwise ordered the speeds of the new reduction printers are 30 and 60 feet per minute.

The reduction printer can make 16 mm. prints from either a 35 mm. or 16 mm. negative, and it can also make dupe negatives from either a 35 mm. or 16 mm. print. When the lamp-house is in the position on the 16 mm. end of the machine 35 mm. prints may be made from a 16 mm. negative and 35 mm. dupe negatives may be made from a 16 mm. print. A double machine is necessary for printing color film in production work.

The camera type movements may be operated at camera speeds thus assuring real production. Emulsion speed and lamp wattage being normal, the film will be printed at 60 feet per minute on each side. A double machine therefore normally prints 120 feet of positive film each minute.

The constant glow of the lamp is not changed

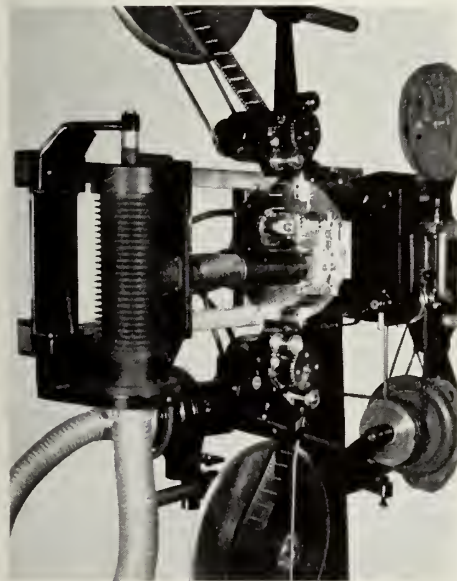
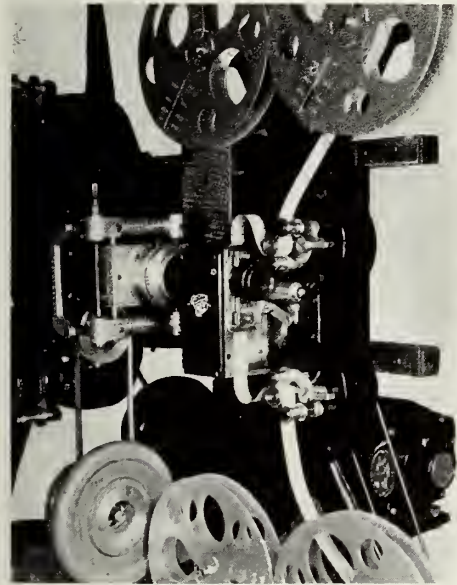


Two views of new Duplex optical printer.

as in past years by resistances, but by placing different diaphragm openings in between the light source and the negative film. These diaphragm openings are punched in a piece of exposed and developed film which automatically travels to the next opening whenever a change in scenes occurs.

Complete operation of the machine from threading up to taking off of the printed reel is simple. Time is also saved due to the machine's portability (it is mounted on rubber tired, ball-bearing casters) and its readiness to operate. It is delivered ready to plug into the current supply for operation.

The usual current is 115 volts D.C. for the lamp circuit and 115 volts 60 cycles for the motor circuit. However, if the voltage and current supply is different the electrical equipment on the printing machines will be altered to suit.



Top: close-up of the 16 mm. side of reduction printer showing lens assembly and adjustment shafts, 16 mm. sprockets, rollers, assembly and ends of shafts, which may be extended for holding the lamp-house for enlarging; Bottom: the 35 mm. side, showing the air conditioning unit for the lamp-house, new V-belt drives, feeding and take-up sprockets, rollers and gate assembly.

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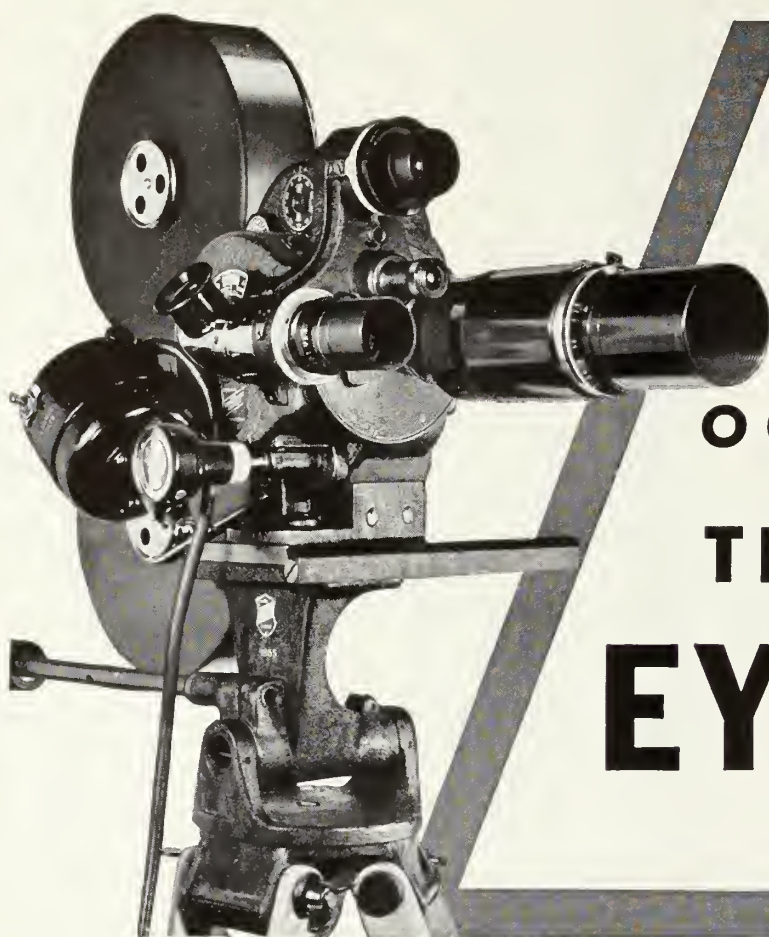


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A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

CLOSE-UPS

The Story of Kalart

Ten years ago unknown but today a leading manufacturer in the photographic field, supplying accurate and virtually fool-proof range-finders and speed flash synchronizers. *By Herbert C. McKay*

(Under the heading CLOSE-UPS, each month INTERNATIONAL PHOTOGRAPHER will in the future present illustrated stories of the companies and organizations contributing to the progress of photography and the allied fields of the motion picture industry. CLOSE-UPS are intended to bring the manufacturers and technicians who use their product into a closer understanding of each other's organizations and problems.—ED.)

The story of Kalart is that of a dream come true within a decade, and it began when Morris Schwartz, Kalart's president, then a press photographer on the New York Times set up night after night working on a device that would fire a flash-bulb and simultaneously trip the shutter of his press camera.

Ten years ago photography was an ac-

cepted fact; today it is an integral part of the life of the nation. Then the photographer was one who tried often and often failed, but today the camera boldly claims, "What can be seen can be photographed." Perhaps the true spirit of modern photography is best reflected by the fact that a decade ago anyone seen on the street carrying a camera was instantly spotted as a tourist; while today the miniature camera is almost an expected part of the sports costume. Ten years ago one of the leading miniatures had just been announced and was being received with hearty guffaws.

Ten years is not such a long time, yet in such a period photographic history has been remade. Panchromatic film was a mystery, not even the "high ortho" emulsions of today had been developed. Motion pictures struggled with ortho stock and the amateur patiently tried to get results with

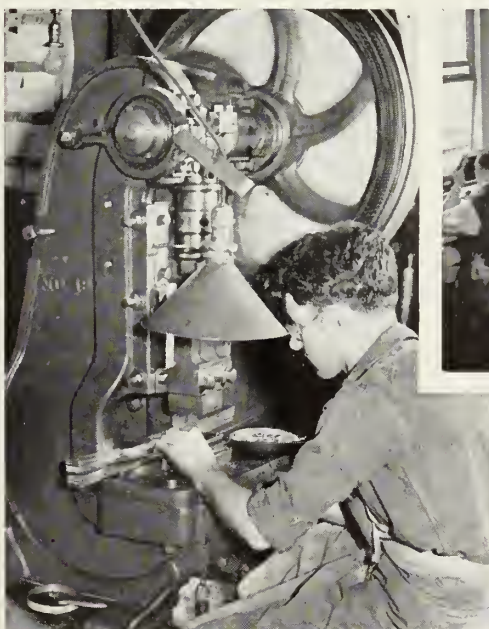
the "T" type lamp or the sputtering carbon arc.

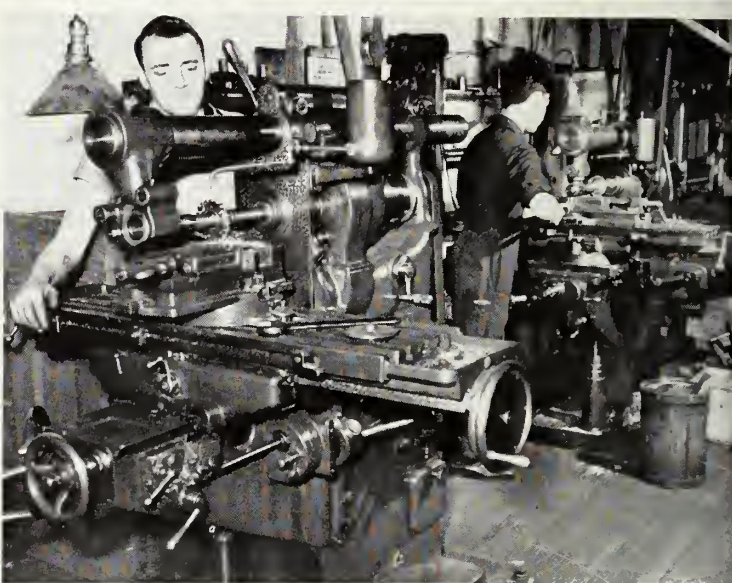
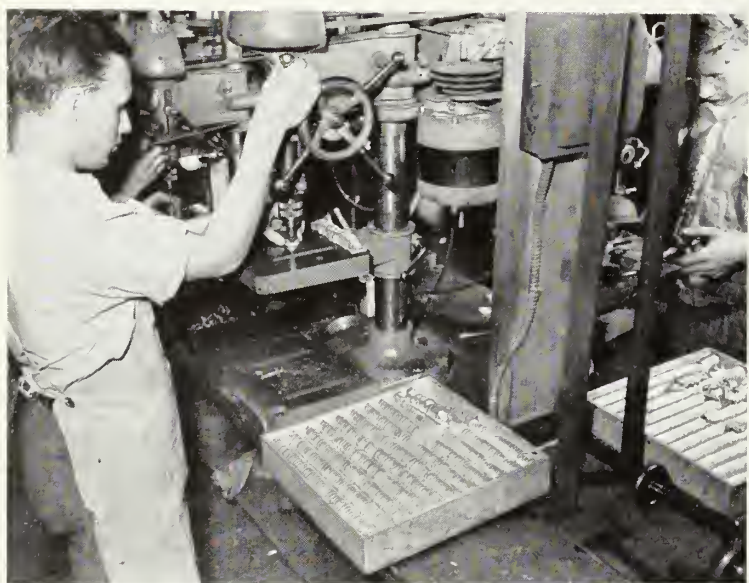
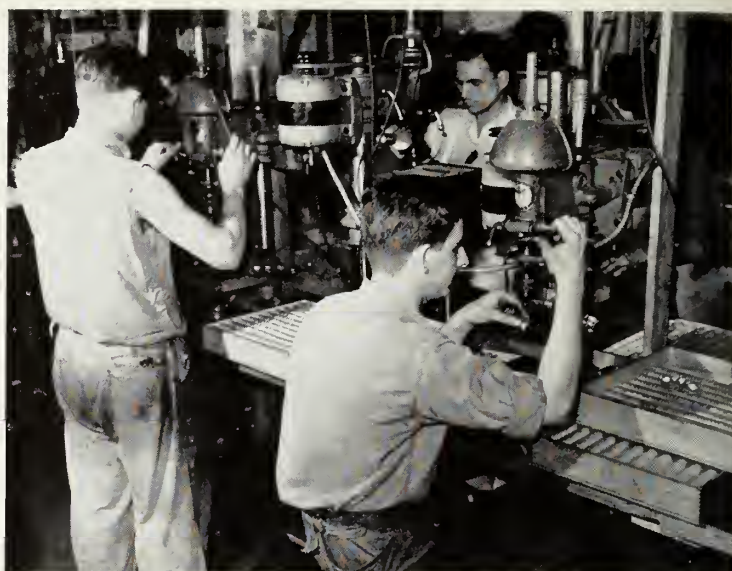
It is true that the f:2 Ernstar lens had been announced, and a 1.5 for cine work had been reported; nevertheless the 3.5 was the speed lens of the day. Speed was sought in other directions by using lenses of fused quartz to take advantage of the ultra-violet.

The lowliest amateur or the most proficient professional of today would be at a total loss if asked to work under the conditions of ten years ago. At that time beginners were solemnly warned about the dangers of flash powder; how it must be kept dry; precautions which must be taken to prevent disastrous explosions; warnings against using flash in a closed room because of the fumes and "snow" which resulted.

In those days, if you couldn't estimate distances you were doomed to limit your work to a tripod and focusing screen or use a reflecting camera which was bulky.

Left: section of crowded storage room for range-finder dies; Center: power press stamping out range-finder parts; Upper Left: assembling range-finders; Lower Left: the synchronizer department shipping room.





In fact the camera in vogue then was one or another of the reflecting type.

Today the complete outfit; camera with synchronized range finder, synchronized flash equipment and perfectly safe flash bulbs can be carried in a small shoulder strap case or in a couple of pockets. Today the photographer, amateur or professional, is independent of conditions; day or night, winter or summer, rain or shine, indoors or out—it's all the same, he goes ahead and makes his shots. More than that his percentage of bull's eyes is far higher than it was a decade ago.

The fact that photography is today almost universally practiced is a direct result of its having been perfected to a degree which makes success almost automatic. To this the mechanical perfection of cameras, the introduction of faster lenses and more sensitive emulsions have contributed greatly. However, more than anything else, the amateur, the news cameraman and the professional have acquired greater confidence in their ability to produce through the elimination of guesswork regarding focusing and exposure.

First came the flash bulb, providing safe illumination at high intensity and short du-

ration, totally independent of fixed sources of current supply. Truly efficient and portable photographic light had been attained. Next came the coupling of the lens mount with an accurately adjusted range finder, and the necessity for using the ground glass had been dispensed with.

With these two great advances photography was greatly simplified and rendered more accurate. The only thing remaining was the problem of using a flash of practically instantaneous period with a shutter exposure short enough to stop motion. The answer lay in an old, old idea. More than fifty years ago magnesium "blow lamps" had been connected with a crude shutter by means of pneumatic pressure through rubber tubes; but now electricity replaced the air hose, uniform flash bulbs replaced the magnesium lamps and the speed flash was born.

Bulb manufacturers cooperated to the fullest extent, working to produce bulbs with uniform firing characteristics, and with such success that a bulb which fails to ignite within specified time limits sufficiently accurate to work with an exposure of 1/500 or even less is a rarity.

Devices for firing the bulb and operating

Upper Left: four gang drill operating on range-finder tubes; Upper Right: spotting and drilling synchronizer castings; Lower Left: routing, inter-cutting and drilling synchronizer castings; Lower Right: tool and die department, where milling machines cut and match parts for range-finders and synchronizers.

the shutter in synchronism appeared upon the market by the dozen, but either they were not accurate or they worked positive damage upon the shutter. One by one they died out. Today the Kalart Speed Flash remains as the original normal operation synchronizing device; normal because it operates by exactly replacing the shutter release for which the shutter was designed.

Carefully tested upon specially designed electronic control meters which instantly indicate errors of a slight fraction to a thousandth of a second, Kalart synchronizers are now faithfully serving thousands of enthusiastic owners; professionals, amateurs, travelers, newspaper cameramen, photographers in every branch of the work. Even in such highly specialized fields as clinical photography and photomicrography the Kalart Speed Flash is making possible photographic work never before within the ability of man.

Coincidentally with the development of

the Speed Flash, Kalart attacked the problem of equipping cameras of the conventional type with a synchronized range-finder. While the miniatures are wonderful in their record of accomplishment, they have several grave faults. Serious photographers clung to the larger camera, even in the amateur field. The $2\frac{1}{4} \times 3\frac{1}{4}$ and the $3\frac{1}{4} \times 4\frac{1}{4}$ continued to sell by the thousand while the 4x5 newspaper camera remained standard.

The problem lay in the fact that these cameras were equipped with every conceivable type of lens; lenses with focal length far, far from that with which they were labeled. However, after endless research and experiment the present day Kalart range-finder was developed; a range-finder built with the utmost precision. Even the first surface reflectors are made of flawless optical glass ground and polished with the careful precision used in grinding the finest lenses.

The Kalart range-finder may be accurately adjusted to any lens regardless of its true focal length; adjusted so accurately that at any distance from infinity down to its near limit, the accuracy of focus is greater than can be achieved by the keenest eye; because in visual focusing the grain of the focusing screen is always a source of error.

The one fault of the non-integral synchronized range-finder has been its limitation to lenses not exceeding 18 cm. focal length. Recently the Kalart Pantagraphic Transmission has been perfected which permits the interchange of short focus and telephoto lenses upon the same camera, using the same range-finder. For example, the interchange between 15 cm. and 30 cm. lenses upon a 4x5 Speed Graphic has been made easy without disturbing the accuracy of the range-finder.

These developments have extended the application of the range-finder to cameras as large as 5x7 and for lenses up to 30 cm. focal length.

The contributions made by Kalart to modern photography are far from the least which have been made. Dead sharp negatives, fully exposed regardless of time, place or speed of the subject has been made easy by the use of Kalartized cameras.

Today the Kalart offices, sales, service and assembly departments now occupy the entire 20th floor of the Broadway Building, 915 Broadway, new York City. The machine shop is in the downtown section of Manhattan. Recently a West Coast branch was opened in the Taft Building in Hollywood, where the INTERNATIONAL PHOTOGRAPHER's editorial office is located. This office gives factory service to western dealers and studio photographers.

Kalart's president is a modest and retiring type, and it is at his request that we do not publish a picture of the man responsible for the devices used by so many press photographers and studio stillmen. Our illustrations are devoted to the Kalart plant and the people who make Kalart devices.



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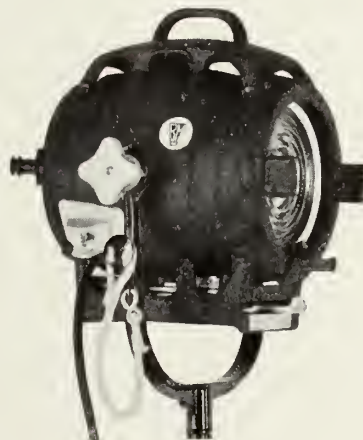
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NEWS OF THE MONTH

CINEMATOGRAPHY

16mm Reaches Technical Majority

After years of predictions and hopes, sub-standard films now reaching status paralleling 35 mm. professional standards through improvements and refinements by manufacturers.

After five years of predictions and hopes, the sub-standard 16 mm. motion picture now is ready to assume important proportions alongside its professional parent, the standard 35 mm. product that today leads the entertainment world. Informed trade figures state that sensational news will be made in the sub-standard field within the next year and that within another decade, the narrower film may seriously rival the larger as a commercial vehicle.

Factors entering into this new phase involve both technical problems and financial and distribution angles. Up to the present time, experts of the manufacturing companies frankly admit, when talking "off the record," that cameras, projectors, sound, film, lenses and other important technical sinews of production have been far below professional 35 mm. standards. Likewise, there was neither sufficient interest by enough commercial organizations to spend money for sub-standard productions, nor adequate distribution and exhibition facilities. This entire situation was complicated by the adding of sound to film, which set back the sub-standard field considerably during the past decade.

Today sub-standard equipment can be rated fairly as being on at least a semi-professional basis and there is an intense if not overly-publicized race by all the important manufacturers to put it on a 100 per cent par with 35 mm. equipment. This

DOCUMENTARY is the way newsreelers covered the construction of the new Parker Dam, which was put into operation last month, joining Hoover Dam as an important link in the Southern California water supply setup. Starting at the top, the large pictures clearly show the progress of the dam construction from the original site to final night-work on its completion. These pictures are part of the *Movietone News* picture record of the job. Bottom strip shows *Movietone News* cameraman Al Brick, member of Local 659, IATSE., trying to keep himself and camera cool while shooting the huge engineering job in desert temperatures; photographed by Warren McGrath, *Movietone News* soundman, member of Local 695, IATSE.

applies all down the line from cameras and projectors and screens to the film, lenses, developing and printing equipment, sound systems, reproduction systems and of especial importance, color.

The editors of INTERNATIONAL PHOTOGRAPHER are in possession of confidential information that assures that these are no random predictions. With regard to color, sensational plans are in the engineering stage and major advertisers are waiting eagerly with contracts for a contemplated

setup to deliver economically quantity color prints on sub-standard stock. The current wave of revisions of models in the sub-standard field is merely the forerunner of sweeping improvements and refinements, which will utilize to the full the results of millions of dollars in research for 35 mm. feature production problems.

That there is a definite boom ahead in commercial production in sub-standard product has been widely heralded in the trade press of both the motion picture and the advertising industries. This rests on a technical framework of recognition by the emulsion manufacturers that there is plenty of cash on the line for sub-standard commercial work. Consequently new lines of perfected and improved film are being made available and for the first time it now is possible to shoot first-class work of standard professional calibre direct on 16 mm. and to get satisfactory processing for consistently satisfactory quality in release prints.

Is There an Educational Film Market?

Move now under way to clear up the chaotic conditions in this field and bring producers and film users closer together through practical program.

By Annette Glick Barnes

Assistant Supervisor, Visual Education Service, Los Angeles City Schools

Soil may be very rich, but if it is never stirred it may be as unproductive as barren wastes of rock. So with the school market for educational films—the market is clearly there, it is a good and growing one, but up to the present it has remained a potential market alone, promising but unorganized.

The tragedies in the past in which major producers of professional films have turned to the school market for a vehicle for their artistic and sincere expression have been many. These fine producers failed to realize in advance, though there were clear signs and warnings, that they could not merely confine their efforts to production, but that they must concern themselves equally with the problems and labor of actual distribution.

The producer of educational films up to the present, unless he wished to sell his product direct to one of the rental or sales distribution companies, has been forced to do his own selling. When once his film was completed and the last fade-out had gone through the optical printer, his troubles were just beginning.

In the motion picture industry the producer, the distributor and exhibitor all are

highly organized; whereas in the school field there has been up to the present a simple but regrettably inefficient three-in-one arrangement, whereby the producer also must distribute and even do some exhibition if he was to make his produce known.

Formerly the lone educational film producer has had to cool his heels in the anteroom of every visual aids department in the country, screen his offering before a thousand evaluation committees, interview ten thousand curriculum authorities, wander from bureau to bureau, desk to desk, in the attempt to ferret out in the maze the final person who actually had the authority to place the stamp of approval upon the film and really *buy* it!

By the time he had wandered down the labyrinthine ways of the typical Board of Education office and polished many apples upon his well-worn sleeve, his actual production costs faded into insignificance in comparison to the mounting cost of shoe leather!

A development of unprecedented significance in the educational film field which will undoubtedly change all this is the recent announcement of the American Council on

Education that its influence and financial weight will be brought to bear upon the effort to bring both the producer and consumer of school films together. The details remain for members of the new organization to work out cooperatively, but the fact that there will be such an organization of the school-church-club market for worth-while films is now fixed, by which visual education departments and other buyers of the best instructional films will be informed of sources through periodic lists, and producers on their side will be made familiar with the buyers of educational films and of their needs, standards, and requirements.

Such a list of available films, it is true, has already been made available through the indispensable and pioneer catalogue list published by H. W. Wilson Company (950 University Avenue, New York City), publishers of *Readers' Guide to Periodical Literature*, *The Motion Picture Review Digest*, and other cumulative lists to current publications.

The *Educational Film Catalogue* is, in fact, the *sine qua non* of all film listings in the school-club-church film field. Not only is there a complete listing of all available films which have an educational application, but the quarterly supplements are cumulated at the end of the year in an annual which is on the desk of every director or social worker who attempts to keep abreast of the sources of his recreational and instructional film supply.

Though the *Educational Film Catalogue* lists all known film sources, no attempt has as yet been made to include valid evaluations, that is, ratings of the educational value of the film in certain grade and age levels. Accordingly, the producer who sees a list of twenty or so subjects listed under the title, "Markets and Marketing," need not conclude that there is no room for his own production, due to probable oversupply. The truth may be that of the twenty or so subjects listed, only one may be found suitable for the specific unit of study or social or age level wanted by the educational film library.

So far the *Educational Film Catalogue* lists the title, source, and form of the film, including a short synopsis and opinions of users of value, where these are available, but a scale of measurement of value for the specific purpose for which the film is designed still remains to be evolved in the science of educational measurement.

A number of visual aids specialists are working upon various rating scales and a combination of these, and some day an actual scale of measurement of the value of films for specific social and chronological age levels and for units of instruction will be forthcoming.

No doubt the standardizing of the various evaluation systems used throughout the country will be one of the early and important jobs attempted by the new cooperative organized by the American Council on Education so that educational films will not only be listed and made available to members of the cooperative, but ratings will be given in

terms of the objectives for the use of the film, much as summaries of opinions of critics and individual groups are given in the *Motion Picture Review Digest* of theatrical films.

The purposes of the cooperative educational film library association as stated in its first mimeographed report to participants in the preliminary organization plans indicate that it will:

(1) Serve as a center of information on film production, film sources, and film evaluations;

(2) Purchase prints cooperatively for member and non-member organizations of the association, thus effecting a reduced price to member organizations and stabilizing the market for educational films;

(3) Compile and print in loose-leaf form a basic catalog to be supplied to each member organization;

(4) Ascertain from member organizations their needs for types of film materials and various subjects, and make this information available to producers.

The association is to be one of limited liability, non-profit in character, but where members are free to buy elsewhere on the basis of open bids. The association will no doubt negotiate with the producer for a price on a number of prints to be determined by a preparatory canvassing of the needs of the member organizations.

The report of the American Council on Education states that eight or more sources of improved educational pictures are awaiting only the assurance of adequate distribution before releasing their offerings. These sources are listed as follows:

1. *Commission on Human Relations of the Progressive Education Association, headed by Dr. Alice V. Keliher.*

This significant project includes the cutting and editing for classroom use of standard theatrical classics like "The Story of Louis Pasteur," "Fury," "The Black Legion," important for their social points of view. Approximately 30 feature theatrical films have been edited. Release of the films has been hitherto prevented through the lack of a wide enough non-commercial distribution system to carry the costs.

2. *Standard Educational Film Companies—Eastman Kodak Company, Bell & Howell, ERPI Picture Consultants, Inc., Bray Pictures Corporation, etc.*

It is now expected that the past limited distribution of the products of these well-established, veteran, and standard film companies will be amply recouped upon the organization of an adequate distribution system.

3. *Theatrical Shorts.*

This is the project wherein, through a grant of \$50,000 from the Motion Picture Producers and Distributors of America, Inc., thorough reviewing panels of educators waded through a list of 2,000 films from some 10,000 short subjects produced over a number of years, and of these selected about 900 subjects as suitable and desirable for educational release. The recommended subjects include the best of the travelogs, the Walt Disney productions, and such other subjects as "The Perfect Tribute," and the splendid cycle, "The Servant of the People," "Give Me Liberty," and probably "The Song of a Nation."

4. *Foreign Films.*

These include the abundant foreign sources, particularly as regards foreign language instruction, and films which lead to international understanding of foreign cultural aims and contributions.

5. *University Productions.*

These are general education films produced for the specific needs of a particular university, which in addition have general educational value.

6. *Independent Producers.*

This is one of the richest and most abundant

sources. The amateur sometimes comes as close to actual school needs as the well-established professional, where the latter narrows himself down to techniques and mechanical accomplishments rather than educational needs and applications.

7. *Government Production.*

Illustrations are the splendid products of Pare Lorentz in the documentary film field, "The Plow That Broke the Plains," and the memorable "The River," which have set a new standard for film accomplishment in this country.

8. *Industrial Sources.*

Excellent commercially sponsored films are available in good numbers and are entirely free from objectionable advertising, such as "Rhapsody in Steel," produced by the Ford Motor Company, and U. S. Steel Company's Technicolor series. A second classic which should be added is "Master Hands," produced by Jam Handy for Chevrolet. "While industrial concerns often maintain their own distribution systems, there is no existing organization which sorts industrial distribution into the good and the bad," says the report. "Free distribution of industrial films has become a center of considerable agitation in educational circles, and many educational film distribution libraries are eliminating industrial films completely. Such drastic action deprives education of good films as well as saves it from bad ones."

9. *Teacher-Training Films.*

This ninth classification, it is believed, should be added to the list, due to the scarcity of such well-made amateur and professional films recording the worth-while unit of study. The scarcity of the supply in this field is in inverse ratio to the demand on the part of teacher-training institutions and boards of education.

It is clear that the potential producer of educational films should keep his ear close to the ground for developments as the work of organization proceeds with this significant effort.

The professional, semi-professional, and amateur all will have a channel through which the buyer of educational film products can be reached. The producer will have someone to whom to go who is closest in touch with school needs throughout the country. He will be advised (if he wants advice) as to his scripts, his techniques, and his treatment. And he will be encouraged, through actual distribution of his films, even though slow at first, that semi-professional-amateur though he may be, he can often strike the school needs through imagination, a fresh point of view, creative approach, and an intimate knowledge of educational films and objectives as well as, or better than, the professional with all his perfection of appointment and his millions.

Enlarger Aids

FOR OWNERS OF Valoy, Vamax, Vogos, Vokom, or Focomat I enlargers, E. Leitz, Inc., distributors of these instruments, have produced an enlarger film holder which fits into the negative stages of these instruments. The holder has a pressure plate for holding film in a flat plane and has a dark slide exactly similar to that on a large plate or film holder which must be pulled out before making the exposure.

In addition to the enlarger film holder, Leitz have produced a color slide carrier for use with these instruments which enables separation negative or black-and-white negatives to be made from color transparencies bound in the form of 2x2-inch glass slides. This device exactly positions such a slide over the aperture in the enlarger and prevents it from moving around.



LIGHTING-SETS

Grip Equipment

Another batch of gadgets for the Studio Mechanics Handbook.

By G M. Haines, Local 37, IATSE.

In getting the Studio Mechanic's Handbook under way, we now have in hand individual pictures of more than 40 items of grip equipment used in the studios every day. Last month we presented a layout of grip equipment used to block off light and this month we present another layout of equipment used by the grips to assist the juicers in their work of lighting the sets. As intended for final publication, each of these items will be pictured individually with complete descriptive data, but it has been thought advisable to also publish in INTERNATIONAL PHOTOGRAPHER layouts of connected series of items, so that we may secure the cooperation of all IATSE members in compiling as much accurate data as possible on each individual item.

We sincerely hope that all members of the "IA," whether in Local 37 or in other studio locals, will accept the invitation to

make suggestions or criticisms of our coverage of these series. We welcome every suggestion that will make this Handbook as complete as possible. Particular information sought includes: correct technical name; slang names used at various studios; size and other minimum specifications; brief descriptions clearly defining the use of each item in studio production.

We also wish to extend sincere appreciation to the stillmen members of Local 659, IATSE, at 20th Century-Fox, for their ex-

cellent and able cooperation in supplying our illustrations. The current layout was photographed by Frank Powolny and last month's layout should be credited to Gene Kornman.

The items pictured this month are:

1. Overhead Celo Diffuser for strip lamp.
2. Overhead silk diffuser for strip lamp.
3. Diffusing strip.
4. Spill ring.
5. Five K lamp diffuser.
6. Trombone hanger, for baby spot lamp.
7. Barn door.
8. 18-inch gilly.
9. Junior one-inch to 9-inch snoots, grouped in nest.
10. Wire screen for diffusing.
11. Junior metal barn-door snoot.
12. Diffuser box container, for Juniors or 80's.
13. Floor goose-neck lamp stand.
14. Spill snoot.
15. Baby plate snoot.
16. Lamp hanger, for use above camera blimp.
17. Baby diffuser.
18. Fin snoot.
19. Four-inch junior snoot.
20. Half-moon snoot.
21. Eye snoot.

Studio Contacts Aid Lamp Design

Practical testing under actual production conditions along with exact photo-technical research facilities responsible for excellent performance of modern motion picture lighting units.

Behind any unit of motion picture studio lighting equipment is a background of modern engineering and intelligent cooperation. None of these units "simply happened" to be built; each is the result of a specific

need on the set, made possible by a combination of pure scientific research, practical photo-technical necessity, and production engineering to give motion picture craftsmen a better tool with which to work.

Only in Hollywood, where a majority of



Planning a new lamp: the engineers' first conference. Left to Right: Elmer Richardson, Peter Mole, and draftsman McKinley of Mole-Richardson.



The optical bench, where globe, lenses and mirrors are combined to prove new ideas in lighting equipment design. Phil Coates, of M-R, at work.



Close-up of an experimental arc bench.



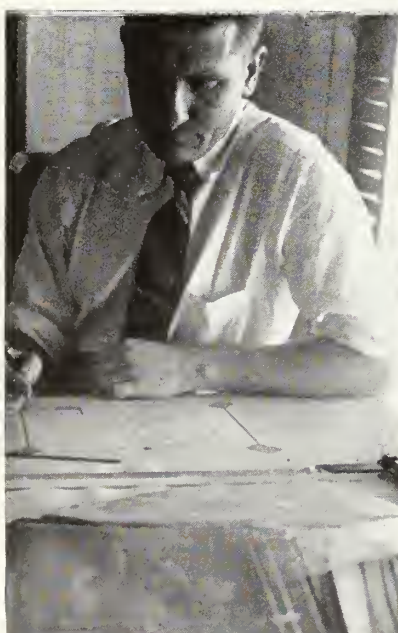
The arc test machine at work. Note photoelectric "eye" at right, coupled to recording instruments.



What the engineer sees—a high intensity arc in the M-R arc tester, photographed by its own light.



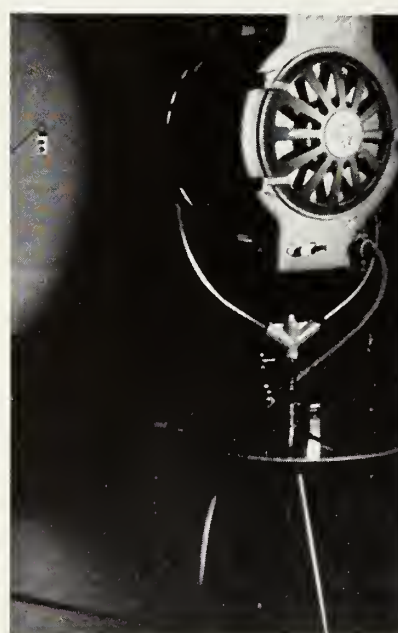
Only four of these experimental arc conditions found.



Putting ideas for a new lamp on paper.



The General Electric recording photometer.



Testing the beam distribution of a Solarspot. Note angular scale on lamp-base, and photoelectric "eye" on far wall.



The final step—a livery to a Hollywood film production.

the world's film production is centered, could this precise combination be achieved with the speed and economy that exists in this case. Only in Hollywood could designing and production engineers be in such close daily contact with the ultimate, prac-

tical users of their products.

Among the leaders in this activity is the Mole-Richardson Company, which has been active for more than 11 years. The firm's engineers are in close contact with the research laboratories of General Electric,

keeping abreast of all new developments in Mazda light globes, and with the laboratories of the National Carbon Company, where improvement in arc carbons is constantly going on. On the other hand, the Hollywood firm's same engineers are in



on M-R's optical



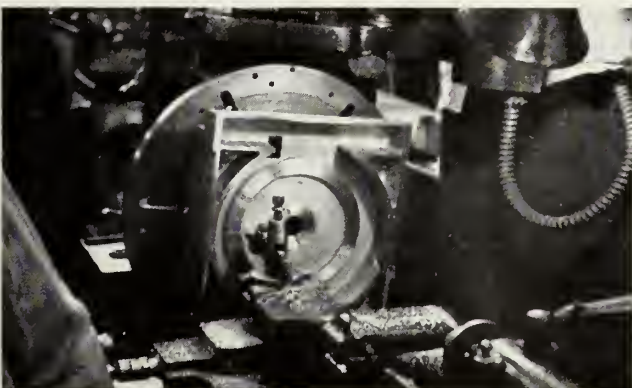
Through an eye-protecting shield, an engineer studies the performance of a 150-ampere arc under test.



Engineer watching the ammeters, volt-meters, etc., which are measuring current while recording photometer (at left) draws a picture of lamp performance.



Mole-Richardson's can reproduce the arc.



Precision machine-work on a quantity basis in M-R's Hollywood factory.



Quantity production! Soon this stack of parts will be assembled to make a batch of M-R H. I. Arcs for some Technicolor production.



lamps waiting de-



As one engineer peers through glare-softening shield at a new arc lamp, another watches electrical meters tell the story of its performance.



Designing lamps calls for constant checking of complicated mathematical data.

An impromptu conference in



the M-R back shop, as practical points about an experimental lamp are discussed by designer, draftsman and shopman.

close daily contact with the cameramen and electricians of all the Hollywood studios, and are in intimate touch with the ever-changing requirements of studio lighting.

These contacts with manufacturers and users mark the starting point of most lamp

designs. In some instances new lamps have been evolved to make more efficient use of some new globe or carbon. In many more instances, new lamps have been evolved as a result of some specific demand by Hollywood's technicians. A familiar example

of the latter is the development of the present Mole-Richardson arc equipment, to meet specific requirements of the Technicolor three-color process.

Once such a need has been made known, the first actual step is a consultation among

the firm's engineers to survey existing light-sources, to learn what may be available to aid them in their project. If it is found that no existing globe, carbon or other device will serve the purpose, the firm's contact with the makers of such products brings their experts into consultation, often with the result that the desired product is not only evolved for the purpose, but finds application as well in other fields of lighting. An excellent instance in this is the development of modern high-powered incandescent globes. The globes originally used were designed for airport floodlighting, and as such were planned to be burned in one position, and as a rule in permanently mounted fixtures. Studio use proved that these globes required re-designing, because continued use caused the filament to sag and ultimately burn out, with an unnecessarily short burning life. When this fact was known, a simple modification of globe design provided a means of automatically taking up this sag, resulting in a better, longer-lived globe.

If the new design being evolved is a Mazda type, the next step is painstaking experiment on the optical bench. This device permits the engineers to "mock up" any imaginable combination of globe, reflector and lens, studying performance under all focal adjustments with microscopic precision.

For similar research into the problems of arc design and performance, the manufacturer's staff created a special arc-testing unit. This is a special, flexible arc mechanism which permits the burning of any type of trim in any position, with the carbons at any angle to each other from 90° to 180°, and, of course, fed with any amount of current desired. Only four of these machines exist: one is in daily use in the Mole-Richardson laboratory in Hollywood, and three in the various eastern laboratories of the National Carbon Company. Like the Optical Bench, this device permits testing of arc mechanisms under precisely governed conditions, with or without any desired combination of lenses and mirrors.

In either of these testing set-ups, careful records are made of current consumption and light output. The latter is measured, not only in terms of overall illumination, but in terms of light distribution at all focal settings. Such tests played an important part in the development of the Morinc lenses used on the now familiar Solarspot lamps. The design of these lenses was the result of collaboration with another eastern firm, also a specialist in its line, but never previously active in any phase of motion pictures. This is the Corning Glass Company, makers of heat-resisting glass and lenses. During this research, before a single Solarspot was made, several dozen different designs for lenses were evolved, and over a dozen types were actually made and tested before the present design was termed efficient enough to

offer a real advantage for studio lighting.

When laboratory research is completed, an experimental lamp is built and given further tests. In any type of lamp, the distribution of light is of paramount importance, and a special device and method for testing this have been evolved. A special pedestal has been made, in which the lamp to be tested is mounted so that its horizontal revolution in degrees is indicated on an accurately engraved scale. The lamp is set up at a predetermined position at one end of the testing room. At the other end, a photoelectric cell measures the light. Thus, with the lamp focused for any desired beam-spread, the distribution of light can be accurately measured by rotating the lamp on its base, and plotting the photometer's readings graphically. The curves thus obtained show at a glance the performance of the lamp. Some show vividly why cinematographers used to have to fight a showed center in the beams of many old-style mirror spotlamps, for there was often a variation of over 300 per cent in intensity between the edges and the center of the flooded beam. Equally they reveal the reason for the popularity of the more modern Fresnel-lensed "Solarspots," which give a smooth, even light at any beam spread.

In testing arc lighting units, steadiness of burning is of utmost importance. This is tested by means of a special General Electric recording photoelectric meter. The photoelectric eye is coupled to a stylus under which a band of ruled paper moves. Variations in the intensity of the light, too small to be perceived by the eye (though often visible to the camera) are recorded as fluctuations in the line drawn by the recorder. The newest type arcs are coming increasingly closer to being able to duplicate the straight, unwavering record of the inkie.

Experimental lamp models are next given practical tests, under actual working conditions. Here Hollywood lamp manufacturers enjoy another asset in their proximity to the studios. Instead of having to ship equipment to Hollywood from a distant factory, with inevitable delay and expense, units may quickly be loaned or rented to a number of studios within the space of a few days, to be used by a variety of crews, under varying conditions. This is a practical preview system which no laboratory test can ever equal.

Once these laboratory and practical tests have been completed, and any indicated modifications made in the design, the lamp goes again to the drafting boards, and the final production design is made. Here the inevitable faults of any experimental working model are eliminated, and the practical details necessary for efficient manufacture are incorporated.

When at last the lamp goes into manufacture, quantity production is possible on a scale really surprising when one considers the fundamental intricacy of some modern lamps. With the exception of such spe-

cialized units as lenses, mirrors and motors, virtually all the components of modern M-R lamps are produced in Mole-Richardson's own factory. With this centralization, economies of volume production are possible, often to an extent seldom previously possible in so relatively limited a field.

Standardization of parts for several types of lamps, wherever possible, permits efficient use of such specialized equipment as one of the new Warner-Swasey No. 4 Universal flat turret lathes. With less careful design such methods of production would be wasteful for the machine would have to be set up to produce parts for perhaps only twenty or thirty units at a time; but with the methods used, related parts for batches of several types of unit—sometimes several hundred at a single run—can be made at once with obvious economies. Standardization is passed on to the consumer in lower first costs and in simplified and more economical repairs in the rare instances when repairs to lamps are necessary.

Modern methods of research and manufacture could be applied almost anywhere; but only in Hollywood could they be coupled with the quick and intimate contact with the practical executives and IATSE members who must handle the finished product. This contact reacts greatly to their advantage, for it first gives them an opportunity to express desires and needs directly to the men who design the equipment, next to test designs under practical working conditions before the final design has been irrevocably determined, and finally to secure improved equipment, or equipment planned especially to meet their specific problems weeks or months sooner than would be possible if the makers of that equipment were not the neighbors and co-workers of those who use it.

Sound Book A Hit

Success predicted by J. N. A. Hawkins (695, IATSE) in his exclusive pre-publication review of the Academy's new book, "Motion Picture Sound Engineering," in the January, 1938, issue of *INTERNATIONAL PHOTOGRAPHER*, has been more than realized. The immediate sell-out of the first edition is assurance that the volume is a timely contribution to motion picture technical literature, covering many new and important developments of recent years, not to be found in any other published tome.

While additional copies are being rushed to supply heavy demand, the new volume last month also received another note of approval in its adoption by the Los Angeles County Board of Education as an official text book for use in the city high schools. Several hundred copies already are in use at the Frank Wiggins Trade School and it has been approved for purchase by the Los Angeles City and County libraries.

INTERNATIONAL PHOTOGRAPHER also can add assurance of the book's phenomenal success, as we have turned over to the Academy Research Council orders that have been received from our subscribers in far corners of the globe. Facilities of this magazine are gladly available to any readers who desire us to arrange purchase of the Academy publication for them.

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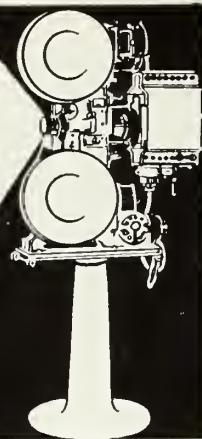
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L & T Adds Kruse Equipment

Landers & Trissell, Inc., studio rentals organization, has taken over the complete equipment that Henry Kruse had in the Hollywood rental field for the past year, including Mitchell cameras, dollies, etc. Entire equipment now is being rebuilt at the Landers & Trissell headquarters on Sunset Boulevard, and soon will be available in addition to their already extensive lineup of rental cameras, cranes, dollies and other accessories available to the independent producer.

New Shop

Rudy Geraus, well-known in Hollywood camera supply circles, opened the Hollywood Photo Supply Company last month with headquarters at 1683 North Cahuenga Boulevard. The new store is equipped with dark rooms and projection rooms and will cater to both professionals and amateurs. Associated with Geraus is Hal Harms.

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PROCESS

Newmatz Projector

Studio projectionist previews efficient new process projector.

By R. L. Monson, Local 37, IATSE

As simple and practical a piece of process projection equipment as we have seen yet is the new model Newmatz rear projector, just on the market. The new model is very versatile and can be converted at a moment's notice from a motion picture projector to a stereopticon or slide projector. This is particularly valuable in view of the trend toward using slides as well as motion picture scenes for process effects.

The unit as a whole is light, weighing about 1000 pounds. This amount of weight is sufficient to hold the machine in place, and it produces a "rock steady" picture despite its light weight and compactness, pro-

HURRELL TO WARNERS. George Hurrell, ace Hollywood portrait photographer of Local 659, IATSE, last month signed a contract with Warners at one of the highest weekly stipends ever paid a studio still photographer. Press of business has kept our contributing editor from turning out a few promised articles on his portrait methods, so well illustrated in the two accompanying shots, but we expect to be able to publish Hurrell contributions in an early issue.

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Joan Bennett photographed by Hurrell.



Tallulah Bankhead photographed by Hurrell.

RELIABLE

IT WAS not by chance that Eastman Super X became the world's most widely used motion picture negative. Super X simply proved over and over that it yielded the world's finest photographic quality. The industry takes no chance in continuing to use this famous, reliable film. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN *SUPER X*
PANCHROMATIC NEGATIVE

viding, of course, that the key plate has been photographed and printed properly. The projectionist may move the projector

about the stage with little help.

Among salient features of the new Newmatz equipment are: remote control focus, fool-proof communications system, and compact interlock. The communication system is of the talk-back variety. This relieves both the front cameraman and the projectionist of the necessity of having to bother with a hand telephone. The novel feature of the remote control focus for the front cameraman, relieves the projectionist of this arduous duty, and permits him to concentrate on perfect operation.

The interlock system is both very compact and very simple. A 'sync' motor drives the projector motor and it in turn drives the camera motor. The projector motor and camera motor are electrically interlocked, so that there is no chance of getting out of 'sync.' This method entirely eliminates the necessity of having to connect and disconnect the interlock every time the setup is moved.

The "movie" head has all of the latest features incorporated in it. The main fire protection feature is the automatic fire shut-

ter, which drops, cutting off the light should the mechanism stop for any reason whatsoever. The registration movement is so perfected that it will not scratch the key-plate whether the projector is run forward or in reverse. The projector uses neither a water cell or air for cooling.

The stereoptican unit is unlike anything on the market. One size of still plates can be shot with a Leica or similar camera. Three sizes of standard plates may also be used. A newly-formulated chemical is used in the cooling system. It has great heat absorption qualities without using up any of the light. This liquid is circulated in a cell between the light source and the slide. The circulation of this liquid does not interfere with the picture in any way; showing no bubbles or heat waves on the screen.

From the viewpoint of a practical studio projectionist, the new machine is quite a credit to William Matz, its developer, who has headed the Newmatz Process Projector Company actively in the field for the past nine years. He has spent this time in constant development work toward the improvement and refinement of the equipment and this new model is quite obviously the culmination of arduous and conscientious labor.

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MPPC Busy

Modern new process plant operating full blast with latest equipment and process facilities.

After several months' delay in getting their new building completed, Motion Pictures Process Corporation, new Hollywood rear projection service organization, is now operating full blast with a complete IATSE staff under chief technician Roy Davidson. MPPC is using the new streamlined Newmatz rear projector, described above, and illustrated on opposite page.

Excellent demonstration of the convertibility of the Newmatz projector to stereoptican use is the top strip on opposite page, showing first, two models in front of the blank screen, and then the composite of the two models with a rear projected Leica transparency. Excellent balance and detail in this rear projection enlargement show the value of this process for commercial art purposes.

Bottom strip in the accompanying layout shows the actual setup in the modern new MPPC plant for a motion picture process scene. At the camera are Roy Davidson and Harry Zeck, chief cinematographer; while standing at left are Ralph Miller, grip, and Bill Johnson, gaffer. Projector can be seen at rear.

Tops of the new process outfit shown in the side-walk conference are: John Gentile, general manager; Mario Castegnaro, vice-president, Davidson and Zeck.

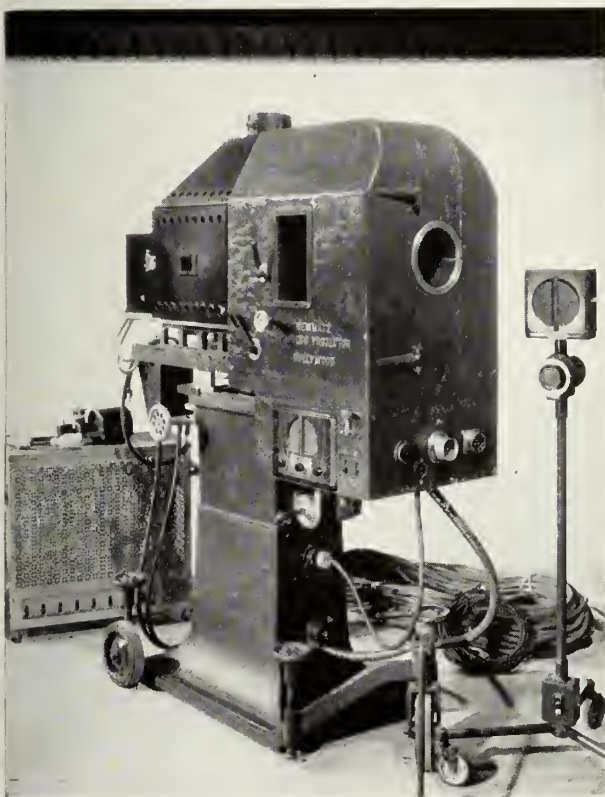
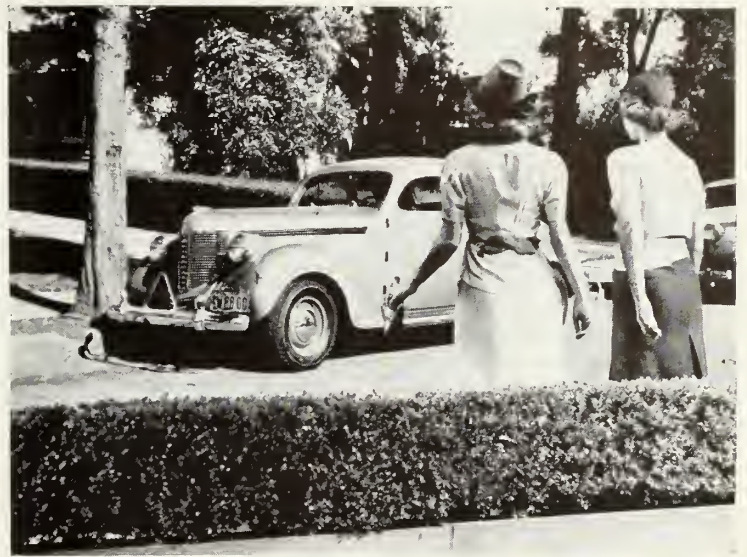
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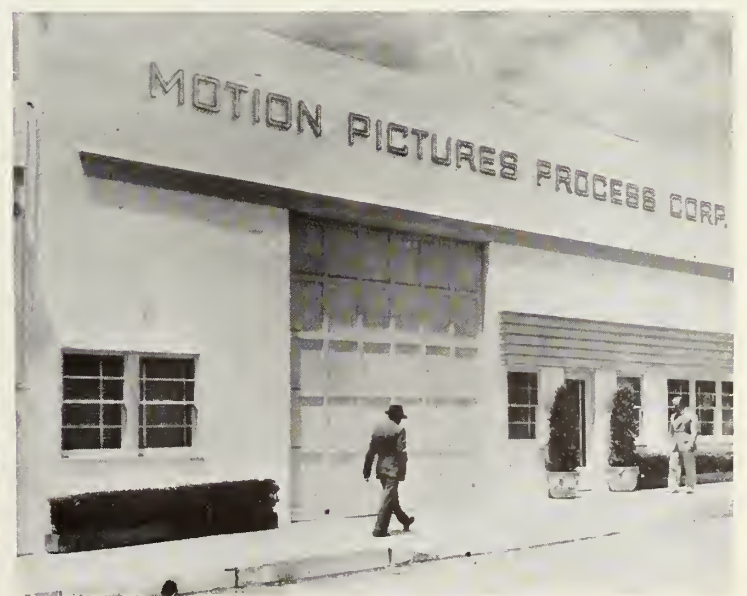
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PR-3822

Los Angeles



Pictures in this page layout covering the new Motion Pictures Process rear projection plant in Hollywood are completely described in the accompanying story on opposite page.



LABORATORY

New Series in Lab Tables Starts

Introducing a new tack in scientific lab methods series with explanation of why much material presented to date seems overly technical to some readers.

By D. K. Allison

It has long been a source of repeated wonderment to chemists of other industries that the operations of photographic chemistry have remained shrouded in virtual mystery. Despite the tremendous advances in the fields of emulsion speed and color sensitivity, the subsequent chemical reactions whereby the latent photographic image is transformed into the visual silver image, and the fixing, washing and coloring operations have until quite recently remained substantially as obscure as in the early days of photography. Formulas for development, fixation and coloring baths were empirically assembled in such proportions that they would yield approximately the desired results, but without any rational regard for chemical or physical efficiency.

When this writer accepted the invitation of Herbert Aller and Ed Gibbons to become a contributing editor of INTERNATIONAL PHOTOGRAPHER, it was with the understanding that all constructive efforts possible would be made to present in the pages of the PHOTOGRAPHER an eventual complete coverage of the modern developments in this field along scientific lines. This has been attempted in individual articles and in the current Laboratory Book of Tables.

Our current program has brought consid-

erable criticism that the information presented is too technical and that much of the material requires at least a college education to be readily understood. It should be understood, however, that the present material must be presented in essentially the form it now is appearing. It is intended for the practical chemists engaged in laboratory processing work and is, in fact, the product of the experience of the writer and other Hollywood experts in practical work on actual production processing.

Not all of the material in the Laboratory Book of Tables, and accompanying articles, is to be presented in such completely scientific form. With the able cooperation of Tom Bryan, secretary of Local 683, IATSE, and a veteran in practical laboratory practice, we intend to translate this material into understandable terms for the average laboratory worker, and also to present a system whereby the untutored but competent craftsmen may be able to develop an understanding of the chemical symbols and other scientific terms used by practical chemists in modern industry today.

However, it is essential in exploring this field for the first time with a consistent program in an industry trade journal to start with the material that would lay the groundwork for the chemical experts. It is our

hope that the eventual results of this program will be authoritative, exact and also practical.

Returning to the subject of laboratory practice, first work in the direction of rational formulation was performed in the Howard Hughes Multicolor organization in the early 30's. Mr. Gundelfinger contributed his noteworthy paper on the chemical relationships in metol-hydroquinone developers and derived the expression for a developing formula showing maximum chemical efficiency for a given characteristic. However, efficient maintenance of such developers, operating at critical optimum concentrations, is of course predicated on the ability to determine accurately the respective rates of depletion of the various developer constituents, in order that rational replenishment may be used to insure the desired gamma and efficiency, with only secondary recourse to sensitometry. For example, if the required gamma and density call for 15 grams hydroquinone per liter, and analysis shows 11.3 grams per liter present, corrective replenishment would require 3.7 grams of hydroquinone to be added per liter.

Furthermore, the Hughes Laboratory was processing colored motion pictures by a purely chemical process, and efficient operation was possible only through the most rigorous chemical control of the color solution. The author was at that time in charge of research and plant control of these laboratories, and in this capacity developed analytical methods which have constituted the previous series of the Laboratory Book of Tables. These methods, in somewhat simpler form, were used throughout the operation of the Hughes Multicolor Laboratory, and are today a decisive factor in the operation of the Cinecolor and Consolidated

The LABORATORY BOOK of TABLES

By D. K. Allison

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M.F. VALUES FOR HYDROGEN ELECTRODE AND SATURATED CALOMEL HALF-CELL IN MILLIVOLTS, AT 25° C.

Tenths									
	.0	.1	.2	.3	.4	.5	.6	.7	.8
H									
0	246	252	258	264	269	275	281	287	293
1	305	311	317	323	329	335	340	346	352
2	364	370	376	382	388	394	400	405	411
3	423	429	435	441	447	453	459	465	470
4	482	488	494	500	506	512	518	524	530
5	541	547	553	559	565	571	577	583	589
6	601	606	612	618	624	630	636	642	648
7	660	666	671	677	683	689	695	701	707
8	719	725	731	736	742	748	754	760	766
9	778	784	790	796	802	807	813	819	825
0	837	843	849	855	861	867	872	878	884
1	896	902	908	914	920	926	932	937	943
2	955	961	967	973	979	985	991	997	1002
3	1014	1020	1026	1032	1038	1044	1050	1056	1062
4	1073	1079	1085	1091	1097	1103	1109	1115	1121

TEMPERATURE CORRECTIONS FOR OTHER THAN 25° C.

Nearest pH unit															
t. ° C.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
15	-.13	-.10	-.06	-.03	.00	+.04	+.07	+.10	+.14	+.17	+.21	+.24	+.27	+.31	+.4
16	-.12	-.09	-.05	-.02	.00	+.04	+.06	+.09	+.13	+.16	+.19	+.22	+.24	+.28	+.1
17	-.12	-.08	-.04	-.02	.00	+.04	+.06	+.08	+.12	+.14	+.17	+.20	+.22	+.25	+.7
18	-.10	-.07	-.04	-.02	.00	+.03	+.05	+.07	+.10	+.12	+.15	+.17	+.19	+.22	+.4
19	-.08	-.06	-.03	-.02	.00	+.03	+.05	+.06	+.09	+.10	+.13	+.14	+.16	+.19	+.0
20	-.07	-.05	-.02	-.01	.00	+.03	+.04	+.05	+.07	+.09	+.11	+.12	+.13	+.15	+.7
21	-.06	-.04	-.02	-.01	.00	+.02	+.04	+.04	+.06	+.08	+.08	+.10	+.10	+.12	+.4
22	-.05	-.03	-.01	-.00	.00	+.02	+.03	+.03	+.05	+.06	+.06	+.07	+.08	+.09	+.0
23	-.04	-.02	-.01	-.00	.00	+.01	+.02	+.02	+.04	+.04	+.04	+.05	+.05	+.06	+.7
24	-.02	-.01	-.00	-.00	.00	+.01	+.01	+.01	+.02	+.02	+.02	+.02	+.02	+.03	+.3
26	+.02	+.01	+.00	+.00	.00	-.01	-.01	-.01	-.02	-.02	-.02	-.02	-.02	-.03	-.3
27	+.04	+.02	+.01	+.00	.00	-.01	-.02	-.02	-.04	-.04	-.04	-.05	-.05	-.06	-.7
28	+.05	+.03	+.01	+.00	.00	-.02	-.03	-.03	-.05	-.06	-.06	-.07	-.08	-.09	-.0
29	+.06	+.04	+.02	+.01	.00	-.02	-.04	-.04	-.06	-.08	-.08	-.10	-.10	-.12	-.4
30	+.07	+.05	+.02	+.01	.00	-.03	-.04	-.05	-.07	-.08	-.11	-.12	-.13	-.15	-.7
31	+.08	+.06	+.03	+.02	.00	-.03	-.05	-.06	-.09	-.10	-.13	-.14	-.16	-.19	-.0
32	+.10	+.07	+.04	+.02	.00	-.03	-.05	-.07	-.10	-.12	-.15	-.17	-.19	-.22	-.4
33	+.12	+.08	+.04	+.02	.00	-.04	-.06	-.08	-.12	-.14	-.17	-.20	-.22	-.25	-.7
34	+.12	+.09	+.05	+.02	.00	-.04	-.06	-.09	-.13	-.16	-.19	-.22	-.24	-.28	-.1
35	+.13	+.10	+.06	+.03	.00	-.04	-.07	-.10	-.14	-.17	-.21	-.24	-.27	-.31	-.4

color processes. From our experience in these laboratories it appears probable that all successful color operations will depend on these or similar methods of analytical control for the maintenance of uniform color quality.

In black-and-white photography, the realization that the methods of physical and analytical chemistry have a very practical application in the developing and fixing operations has finally been expressed by Messrs. Hanson, Evans, and Crabtree of Eastman Kodak Company.

The "Laboratory Book of Tables" which have appeared serially in *INTERNATIONAL PHOTOGRAPHER* will be published under one cover in expanded form in the near future. The new series of tables now starting will present useful information of electrode pH potentials, conversion tables for metric and avoirdupois systems, temperature conversion tables, chemical calculations, and similar data.

The first installment of the new series presents the conversion data for converting the E. M. F. of the hydrogen electrode-saturated potassium chloride mercurous chloride system, into the corresponding pH values. The hydrogen electrode is arbitrarily adopted as the international standard to which all pH and electrode potential determinations are referred. By definition, a hydrogen electrode, in equilibrium with hydrogen gas at one atmosphere pressure, and immersed in a solution containing 1.008 grams (one equivalent) of hydrogen-ions, exhibits zero E. M. F. It is against this arbitrary standard that all other electrode and cell systems are calibrated.

To use the tables proceed as follows: In a sample instance: reading of the potentiometer, 790 millivolts; temperature of solution, 21° C. From the table, 790 millivolts corresponds to pH 9.20 (units in left hand column, tenths reading across). Nearest pH unit is 9, therefore the temperature correction is +0.08 and pH value of the solution is therefore pH 9.28.

Screen Quality

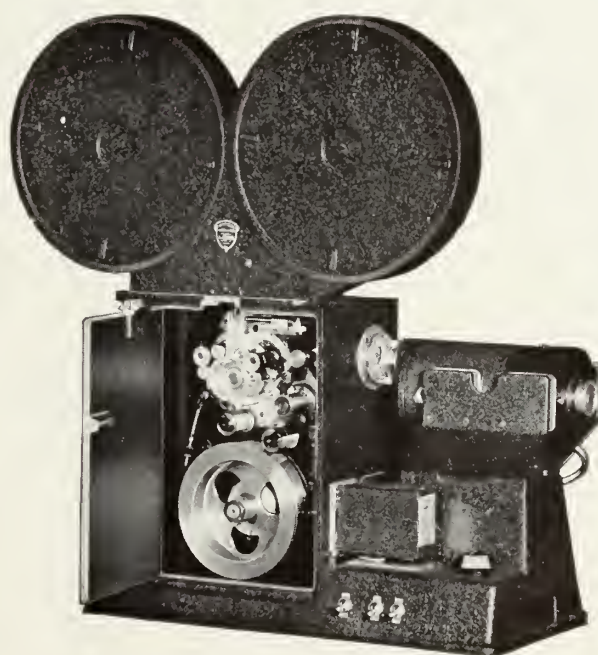
Anonymous contributor takes lab critical jargon for a humorous ride.

A contributor who desires to remain anonymous dropped the following satirical comment—which, incidentally, is an excellent start toward a glossary of studio laboratory slang—on our desk last month. The editors of *INTERNATIONAL PHOTOGRAPHER* do not presume to know whether a standard nomenclature might properly replace the picturesque, if rather general, phrases cited by Mr. "A"; but we did think his comments interesting enough to publish. We're wondering whether they are interesting enough to stir up any further discussion on the subject.

"That 'elusive something' called screen

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*Mitchell sound recorders
and cameras fill the
highest requirements*



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AGENCIES:

Bell & Howell, Ltd., London, England

Claud C. Carter, Sydney, Australia

D. Nagase & Co., Ltd., Osaka, Japan

Motion Picture Camera Supply Co., New York City

Bombay Radio Co., Ltd., Bombay, India

H. Nassibian, Cairo, Egypt

quality! Maybe if everybody who looked at pictures in a studio had a pair of correctly fitted glasses there'd never be any arguments about screen quality. But it's funny how many varied opinions you can get about how the picture looks! And how many terms are current in the industry to describe how it does look!

"Of course, if the cameraman is a friend of yours, you say 'it's nice and brilliant,' or 'lots of snap.' But if he isn't around and you don't like him, then you say: 'it's harsh' or 'contrasty' or 'chalk and soot' or 'hard as nails.' If your uncle gets the screen credit for the cinematography, you say the stuff is 'pleasingly soft' or 'mellow' or has 'nice texture.' If it's your brother-in-law, you'd probably say it's 'flat' or 'mushy' or 'down in the mud' or 'without guts.'

"If you have a grudge against the lab, you call the print 'black as your hat' or say 'it looks like it was printed for night' or 'heavy.' The same print to the laboratory's pal is 'rich,' has 'rich velvety blacks,' or is 'a little full.' And the print that the lab says is 'a little open' or 'on the light side' or 'could stand another point' is liable to be described by the tough producer as 'washed out,' 'bleached,' or 'empty.'"

Reese Heads New Service

H. L. "Pop" Reese, who has been with Wholesale Supply Company in the chemical field for the past 15 years, has joined the

Tibbetts-Westerfield Paint Company as studio division manager of their new Hollywood branch at 1211 North Western Avenue in Hollywood. The firm, which has been catering to studio needs for paint and allied lines, will feature a full line of Baker & Adamson reagent chemicals, paints, enamels, varnishes, lacquers, thinners and shellacs, everything in the line of chemicals and paints used in studio work.

Color Labs

Dunningcolor offers new process and plans lab; Cinecolor building new Burbank plant.

In the laboratory field last month two announcements on color processing were of outstanding interest. After much quiet research and organization the Dunningcolor, three-color process was announced as commercially available, while Cinecolor finally disclosed completion of plans for their long-contemplated new laboratory, to be located in Burbank.

Dunningcolor will be offered to producing companies under a royalty licensing plan, with Carroll Dunning stating that among other economies his proposition offers is a probably base cost of 19 cents per screen foot, plus putting rush prints on the same basis as release prints.

Elements of both Bell & Howell and Mitchell cameras are combined in the Dunningcolor method in which all the lab processing is photographic, instead of by imbibition. Technical details of the new color system will be published in the September issue of INTERNATIONAL PHOTOGRAPHER.

At present, in addition to offering the process through licensing to major studios, under a program allowing the producer to photograph and process with his own equipment subjected to slight modifications, the Dunning organization also is planning installation at their Hollywood plant of a color laboratory with a capacity of more than 5,000,000 feet per year. The color setup is under the direction of Dunning and his son, Dodge, with L. E. Clarke, formerly chief recording engineer for RCA, heading chemical research.

Cinecolor's new plant is also reported to be tied in with a photographic three-color process contemplated for some time by this company, although no details have yet been announced. Meanwhile, a half-dozen purchasers were reported dicker for the International Cinema lab property.

Kalart's English Agents

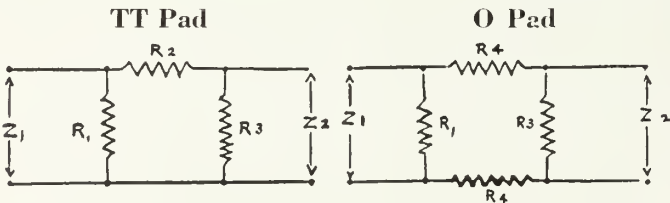
SCHERING Co. of London has been appointed sole agents in England for the Kalart line and the association got under way last month with an initial order of 200 Micromatic Speed Flashes.

The SOUNDMAN'S BOOK of TABLES

By J. N. A. Hawkins

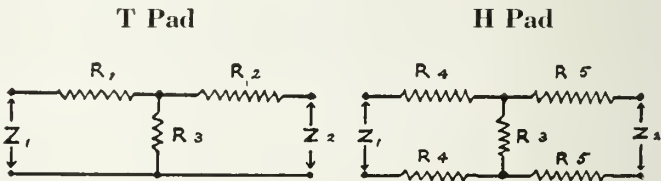
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Attenuation Network Data



Z₁ = 250 ohms
Z₂ = 50 ohms

Loss in D. B.	Voltage Attenuation Ratio	R ₁	R ₂	R ₃	R ₄
13	.2239	433	238	55.7	119
14	.1995	404	269	55.5	135
15	.1778	383	305	55.4	153
16	.1585	363	344	55.1	172
18	.1259	336	437	54.4	219
20	.1000	315	555	53.8	258
25	.0562	288	1067	52.4	534
30	.0316	266	1768	51.4	884
40	.0100	256	5590	50.4	2795



Z₁ = 250 ohms
Z₂ = 50 ohms

Loss in D. B.	Voltage Attenuation Ratio	R ₁	R ₂	R ₃	R ₄	R ₅
13	.2239	223	2.0	53	112.5	1.0
14	.1995	224.5	7.5	46.5	112	3.75
15	.1778	225	12	41	112.5	6
16	.1585	226.6	16.1	36.4	113.3	8
18	.1259	229.4	23	28.6	115	11.5
20	.1000	232.4	28.4	22.6	116	14.2
25	.0562	239.3	38.2	12.7	120	19
30	.0316	243	43.1	7.1	122	21.5
40	.0100	248	47.8	2.2	124	24



NEWSREELERS' ROUNDUP, took place last month at MGM in exploitation tie-up for "Too Hot to Handle," headline story of film reporters, starring Clark Gable. Top Left, Carl Jones, *News of the Day* soundman; Star Gable and Sam Greenwald, *News of the Day* cameraman; Top Right: back row, M. G. MacCarroll, *Paramount News* cameraman; Roy Kluver, *News of the Day* cameraman; Gable, Charles Lehman, Greenwald; Front Row: Jack F. Painter, head cameraman for

Movietone News, now on West Coast for Technicolor research; Carl Bjerre, *News of the Day* soundman; Carl Jones, Norman Alley, camera man and Pacific Coast manager for *Universal News*; Herb Tice; Lower Left: Gable and Joe Hubbell, Pacific Coast manager, *News of the Day*; Lower Right: Charles Lehman, *Movietone News* cameraman; Myrna Loy, co-star with Gable; Herb Tice, *Movietone News* soundman.

PATENTS

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,117,510—CAMERA ATTACHMENT. *Morris Schwartz*, Brooklyn, N. Y. Application April 3, 1935, Serial No. 14,435. 7 Claims. (Cl. 67-29)

Spring operated means for synchronizing the flashing of a flash lamp and operating the camera shutter.

No. 2,117,694—SHUTTER MECHANISM FOR MOVING PICTURE CAMERAS. *Helmuth Becker*, Wetzlar Germany, assignor to Ernst Leitz, G. m. b. H., Wetzlar, Germany. Application May 29, 1936, Serial No. 82,451. In Germany June 3, 1935. 8 Claims. (Cl. 88-16)

Apparatus for producing overlapping exposures comprising a coupling device for automatically and sequentially connecting the shutter with the film advancing means.

No. 2,117,727—MEANS FOR CONTROLLING PRINTING LIGHTS. *Charles F. Jones*, Burlingame, Calif. Application October, 28, 1935, Serial No. 47,092. 15 Claims. (Cl. 95-75)

An apparatus for printing, reproducing colored prints by employing a plurality of colored light beams and automatically varying the color and intensity of said lights during printing.

No. 2,117,806—MECHANISM FOR CAUSING INTERMITTENT FILM MOVEMENT. *Oscar J. Holmes*, Chicago, Ill. Application Feb. 25,

1937, Serial No. 127,709. 25 Claims (Cl. 74-436)

In apparatus for feeding motion picture film, a mechanism comprising a device adapted to be connected to drive a film engaging means, an instrumentality engaging said device to intermittently operate the same, said instrumentality having an adjustable element for adjustment to move said device through a predetermined distance and at a predetermined frequency for all adjustments while varying the speed of movement of said device.

No. 2,118,016—SPROCKET FOR MOTION PICTURE FILMS. *Ernest Ross*, Elmhurst, N. Y., assignor to United Research Corp., Long Island City, N. Y., a corporation of Delaware. Application April 11, 1935, Serial No. 15,771. 7 Claims. (Cl. 74-243)

A sprocket assembly comprising a plurality of sprockets, hubs, and collars so arranged that the films are supported on the shoulder and collar

members while engaged by the sprocket teeth.
 No. 2,118,059—ANTISTATIC PHOTOGRAPHIC FILM.
Alfred D. Slack and Albert A. Young, Rochester, N. Y., assignors by mesne assignments to Eastman Kodak Co., Jersey City, N. J., a corporation of New Jersey. Application Sept. 20, 1935, Serial No. 41,417. 10 Claims. (Cl. 95-9)

A photographic element comprising a support carrying an emulsion layer and an antistatic layer containing a higher fatty alcohol sulfate containing no carboxylic acid salt group.

No. 2,118,087—MOTION PICTURE APPARATUS.
Thomas A. Killman and Robert T. Killman, Nashville, Tenn. Application May 11, 1936, Serial No. 79,040. Renewed April 2, 1938. 3 Claims. (Cl. 88-16.4)

A projector for additively projecting two color value images at the same time to produce a colored picture on the screen.

No. 2,118,519—COLOR FILM. *Franz Noack*, Berlin, Germany. Application March 19, 1936, Serial No. 69,615. In Germany Nov. 16, 1933. 7 Claims. (Cl. 88-16.4)

A film strip having slits between the frames to increase its elasticity and thereby facilitate accurately registering it with another film.

REISSUE NO. 20,748—METHOD FOR SUPERPOSING PARTIAL IMAGES OF POLYCHROMATIC SELECTION AND PROJECTING THEM TO OBTAIN AN IMAGE IN NATURAL COLORS. *Carlo Bocca*, Vigevano, Italy. Original No. 2,050,417, dated Aug. 11, 1936, Serial No. 681,472, July 21, 1933. Application for reissue Nov. 25, 1936, Serial No. 112,708. In Germany Aug. 8, 1932. 1 Claim. (Cl. 88-16.4)

A method of printing colored pictures which employs a diffraction grating and lights of different colors.

have back with us the West Coast IATSE gang's friend and technical "prof," William Comyns, with his Projectionist's Tables and other information. Comyns now is recovering at his home from a major operation performed last month.

Thanks to the cooperation of Messrs. George Urey and W. W. Wolfe of RCA's Hollywood office (heads of the service and engineering departments, respectively) who have assigned such well-known experts as C. N. Batsel, W. S. Thompson and Watson Jones to collaborate on these articles we are getting under way with a discussion of the RCA system. Later we will bring in information on the ERPI system and the Simplex sound setup.

These articles will begin in the September issue and will run for one year, treating a different division of the sound system each month, with quarterly reviews of previous chapters, covering modifications of all equipment as they may appear.

Additionally, IATSE members are welcome to write in to this department for any special information on any subject under discussion. All correspondence will be treated as strictly confidential, unless you desire us to print your name, should the correspondence be deemed interesting enough for publication. Those desiring to be answered personally through the mail should send stamped, self-addressed envelope.

A tentative schedule of subjects to be covered and the issues in which they will appear follows:

SEPTEMBER ISSUE

Optical system in sound head in general:

- (a) Exciter lamp, its care and functions.
- (b) Sound aperture.
- (c) Sound aperture position.
- (d) Sound aperture size.

OCTOBER ISSUE

Sound track dimension and film motion:

- (a) Position of track.
- (b) Width of track.
- (c) Weave of film.
- (d) Flutter.

NOVEMBER ISSUE

Discussion of PEC and associated circuits:

- (a) Review of Articles 1 and 2 with modifications.
- (b) Photoelectric cell characteristics and duties.
- (c) Photoelectric cell circuits.

DECEMBER ISSUE

General discussion of amplifiers and power supply:

- (a) Power supply.
- (b) Type of amplifiers.

JANUARY ISSUE

Amplifier requirements:

- (a) Gain.
- (b) Capacity.
- (c) Tubes.

FEBRUARY ISSUE

General acoustical considerations:

- (a) Speaker systems.
- (b) Noise level in auditoriums.
- (c) Acoustics.
- (d) Reproducing levels.

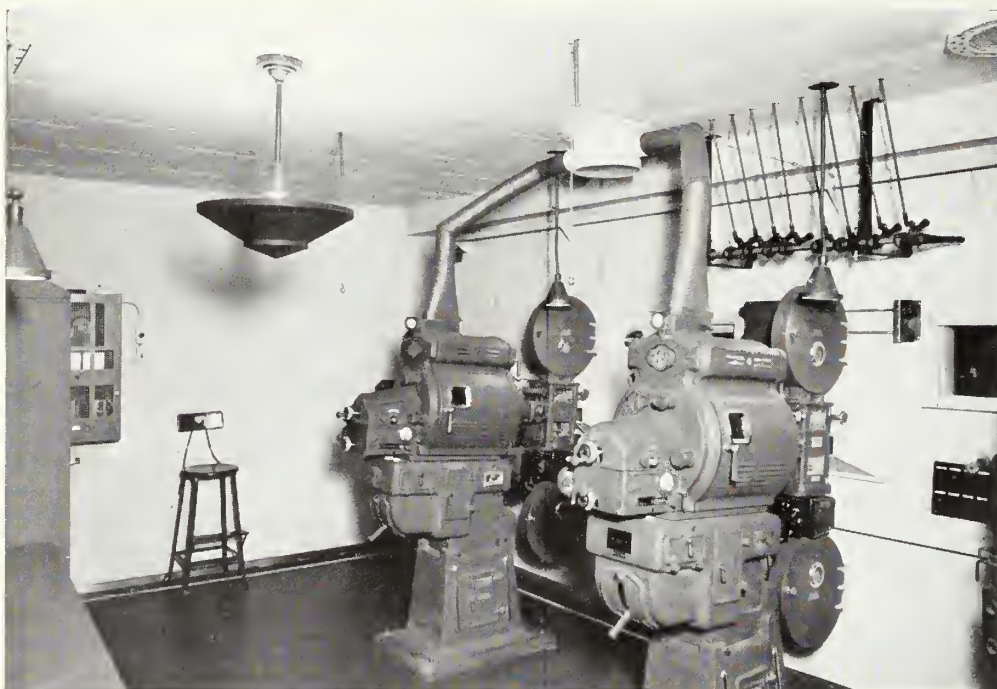
MARCH ISSUE

General review of all articles with recent modifications:

- (a) Push-pull, its meaning and application.
- (b) Bi-lateral sound track.
- (c) Uni-lateral sound track.

As we progress with the above articles there will be at least two practical demon-

PROJECTION



The Green Lake Theatre, Seattle, Washington, features Motiograph projectors and bases, with Model K, Western Electric 211 sound head with Mirrophonic amplification and speakers, Motiograph Model K bases and mechanism with barrel type rear shutter, Brenkert Enarc Suprex lamps.

By Paul R. Cramer, 150, IATSE.

New Series Schedule

After months of research, correspondence and checking with research engineers and studio department heads and technicians, INTERNATIONAL PHOTOGRAPHER now is ready to print the series of articles we have planned covering schematic drawings, photographs and technical information of a practical nature for the practical projectionist on all the new wrinkles that are cropping up in the general program of trying to bring theatre practice in line with the many advances now being made at the studios.

In the past, projectionists have obtained most of their information and technical data from handbooks printed months ahead

of the time of purchase. Sensational technical advances have made much of this material (except for basic reference matter) quite obsolete, because the modernization of sound system has moved so fast. New angles are being discovered daily and are coming from the drafting table into actual use with startling speed.

In order to keep up with this trend and give the manufacturing and studio experts an opportunity to play ball with the projectionists in the field INTERNATIONAL PHOTOGRAPHER has arranged to bring this information to its readers month by month.

Backbone of this service will be a discussion of the three larger sound systems, with the excellent cooperation of their sound engineers. Studio department heads and their technical aides will contribute to the program and we also soon expect to

strations in Hollywood, at one of the studios or at the RCA laboratory in Hollywood, where all IATSE projectionists may come and see the newer type equipment disassembled. At that time there also will be present engineers to describe latest things in sound, some that are in use and some that will be put into use in the near future.

Seattle's Green Lake

The accompanying photograph of the projection room of the Green Lake Theatre in Seattle indicates that the boys in the fair state of Washington are in luck to have a place like that to do their evening chores in; and how they like their Motiographs up there! This is the second streamlined booth from up North. Keep them coming boys, we like them.

Glenn Slipper, at B. F. Shearer Company

in Los Angeles, gave me the dope on this set which I will pass on to the rest of you brothers. The heads in this photo are Model "K" bases and mechanisms, with the improved barrel type rear shutter that Motiograph is noted for, and it certainly keeps the aperture cool. Brother Ralph MacDonald at the Pantages in Hollywood opened the film gate of one for me the other afternoon, and it was possible to put your fingers on the film track without burning them, especially just after you have run a full 20-minute reel with a Suprex type lamp. Don't try this on your older type projectors. Blisters are bad for the fingers.

The booth seems to be completely equipped with Brenkert Enarc lamps even to the spotlight. Not only are these lamps able to dish out the service but they seem to last forever, with practically no trouble. It might be a good thing if some of you brothers who read these lines would drop

in and see Glenn some time and let him show you all about these lamps.

The sound system at the Green Lake is the new Western Electric 211 sound head with Mirrophonic amplifier and speakers. Notice the neat arrangement of the amplifiers on the far wall.

Simplex Sound Tests

Just before going to press, we checked with Brother Frank Hibbert of the Alexander Theatre in Glendale, and learned that the technicians are still experimenting with the new Simplex sound equipment so we will have to wait until next month before the full story is forthcoming. But at that we can rest assured that when the International Projector Company gets through with the Alexander equipment it will be a credit to the new field that they have entered.

The CINEMATOGRAPHER'S BOOK of TABLES

By Fred Westerberg

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CAMERA SPEED—SHUTTER COMPENSATION

CONSTANT	VARIABLE	REQUIREMENT
F-Value	Camera Speed	Shutter Compensation

Camera Speed in Pictures Per Second	EXPOSURE TIME IN FRACTIONS OF A SECOND						
	1/36	1/39	1/48	1/54	1/72	1/96	1/144
	SHUTTER OPENING IN DEGREES REQUIRED TO MAINTAIN EXPOSURE TIME						
96	.....	.....	.....	.....	.....	.....	240
72	.....	.....	.....	.....	.....	.....	240 180
64	.....	.....	.....	.....	.....	240	214 160
48	.....	.....	.....	.....	240	180	160 120
36	.....	.....	.....	240	180	135	120 90
32	.....	.....	240	214	160	120	107 80
24	240	220	180	160	120	90	80 60
22	220	202	165	146	110	83	73 55
20	200	183	150	133	100	75	67 50
18	180	165	135	120	90	68	60 45
16	160	147	120	107	80	60	53 40
14	140	128	105	93	70	53	47 35
12	120	110	90	80	60	45	40 30
10	100	92	75	67	50	38	33 25
8	80	74	60	53	40	30	27 20
6	60	55	45	40	30	23	20
4	40	37	30	27	20	.....	.....
3	30	28	23	20	.....	.....	.....
2	20	18	.....	.....	.....	.....	.....

SHUTTER OPENING—EQUIVALENT F-VALUE

CONSTANT	VARIABLE	REQUIREMENT
F-Value	Shutter Opening	Equivalent F-Value

Shutter Opening in Degrees	EQUIVALENT F-VALUE									
	1.3	1.6	1.8	2.3	2.6	3.3	3.7	4.6	5.2	6.5
240	1.3	1.6	1.8	2.3	2.6	3.3	3.7	4.6	5.2	6.5
200	1.4	1.8	2.0	2.5	2.8	3.6	4.0	5.1	5.6	7
160	1.6	2.0	2.2	2.8	3.2	4.0	4.5	5.6	6.3	8
120	1.8	2.3	2.6	3.3	3.7	4.6	5.2	6.5	7.3	9
100	2.0	2.5	2.8	3.6	4.0	5.1	5.6	7.2	8.0	10
80	2.2	2.8	3.2	4.0	4.5	5.6	6.3	8.0	9.0	11
60	2.6	3.3	3.7	4.6	5.2	6.5	7.3	9.2	10.3	13
50	2.8	3.6	4.0	5.1	5.6	7.2	8.0	10.1	11.3	14
40	3.2	4.0	4.5	5.6	6.3	8.0	9.0	11.3	12.6	16
30	3.7	4.6	5.2	6.5	7.3	9.2	10.3	13	14.6	18
20	4.5	5.6	6.3	8.0	9.0	11.3	12.6	16	18	22

CONSTANT	VARIABLE	REQUIREMENT
Camera Speed	Shutter Opening	F-Value to Maintain Exposure

Shutter Opening in Degrees	F-VALUE REQUIRED TO MAINTAIN THE SAME EXPOSURE									
	2.5	2.8	3.5	4.0	4.9	5.6	6.9	8.0	9.8	11.3
240	2.5	2.8	3.5	4.0	4.9	5.6	6.9	8.0	9.8	11.3
200	2.2	2.6	3.2	3.7	4.5	5.2	6.3	7.3	9.0	10.0
160	2.0	2.3	2.8	3.3	4.0	4.6	5.6	6.5	8.0	9.2
120	1.7	2.0	2.5	2.8	3.5	4.0	4.9	5.6	6.9	8.0
100	1.6	1.8	2.2	2.6	3.2	3.7	4.5	5.2	6.3	7.3
80	1.4	1.6	2.0	2.3	2.8	3.3	4.0	4.6	5.6	6.5
60	1.2	1.4	1.7	2.0	2.5	2.8	3.5	4.0	4.9	5.6
50	1.1	1.3	1.6	1.8	2.2	2.6	3.2	3.7	4.5	5.0
40	1.0	1.2	1.4	1.6	2.0	2.3	2.8	3.3	4.0	4.6
30	1.0	1.2	1.4	1.7	2.0	2.5	2.8	3.5	4.0
20	1.0	1.2	1.4	1.6	2.0	2.3	2.8	3.3

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TRADE WINDS

New Eastman Films

THREE NEW FILMS, intended to more closely adapt the qualities of professional 35 mm film that have made miniature photography possible to amateur needs were put on the market last month by Eastman Kodak Company. The new films offer speeds ranging from equal to four times that of present Panatomic, with finer grain and an emulsion more efficient equally with daylight and artificial light.

The original development of miniature and candid photography during the past ten years has been made possible by the technical advances in emulsions, lenses and processing, to meet demands of the motion picture industry. The film used has generally been motion picture 35 mm stock. Eastman experts have been working toward a type of emulsion more tailor-made to amateur needs, where negatives frequently must be developed to a higher contrast than those used in professional motion pictures. The result is the introduction of these three new Eastman films for miniature cameras using 35 mm or No. 828 films.

Important characteristics in any film are not only high speed and fine grain, but exposure latitude and good quality—the ability of the film to translate faithfully the scale of light and tone values existing in the subject into monochromatic values in the print—and uniformity of the product so that consistently good results may be expected. Eastman experts feel that their new line meets these standards.

The new films are:

Kodak Plus-X Panchromatic film, which has about twice the speed of Kodak Panatomic and about 50 per cent faster in sunlight and artificial light than Kodak 35 mm Super Sensitive Panchromatic film. It is also somewhat finer grained than regular Kodak Panatomic. This film is recommended for general use in miniature cameras.

Panatomic-X, a film of ultra fine-grain for enlargements of great magnification. This film possesses even finer grain than the fine grain that has made the original Kodak Panatomic film so popular with users of miniature cameras.

Panatomic-X has the same speed as Panatomic. The fineness of grain, however, is equal to that which was formerly obtained only by the use of special fine grain developers, which reduced effective speed of the film. Graininess is so low that, with the new film, enlargements can be made of a size which will exhaust the sharpness of images before graininess is visible.

Kodak Super-XX Panchromatic film is the fastest Kodak film ever supplied the miniature camera user. It has about four times the speed of Kodak Panatomic and more than twice the speed of Kodak Super-X Panchromatic in sunlight and artificial light, with grain kept at a minimum.

Maximum emulsion speed is obtained by developing fully in the Kodak developer D-76. With Kodak Super-XX, camera enthusiasts can now get clear detail shots of floor shows, boxing and wrestling bouts in sport arenas, and the high spots in basketball and other floodlighted indoor sports.

Each of these three new Kodak 35 mm and No. 828 films has great exposure latitude, freedom from halation, and a balanced sensitivity

to light of all colors. In order to reduce the effects of halation to negligible proportions, the films are coated on a support which is of a bluish-gray color. Although the developed negatives retain this color, there is no necessity for increasing normal printing exposure times.

The new films are fully panchromatic. They have a very high sensitivity to red light, and in addition, they have been especially sensitized for the green. They do not, therefore, give overcorrection to red objects, such as cheeks and lips, which is characteristic of films which have their main sensitivity in the red.

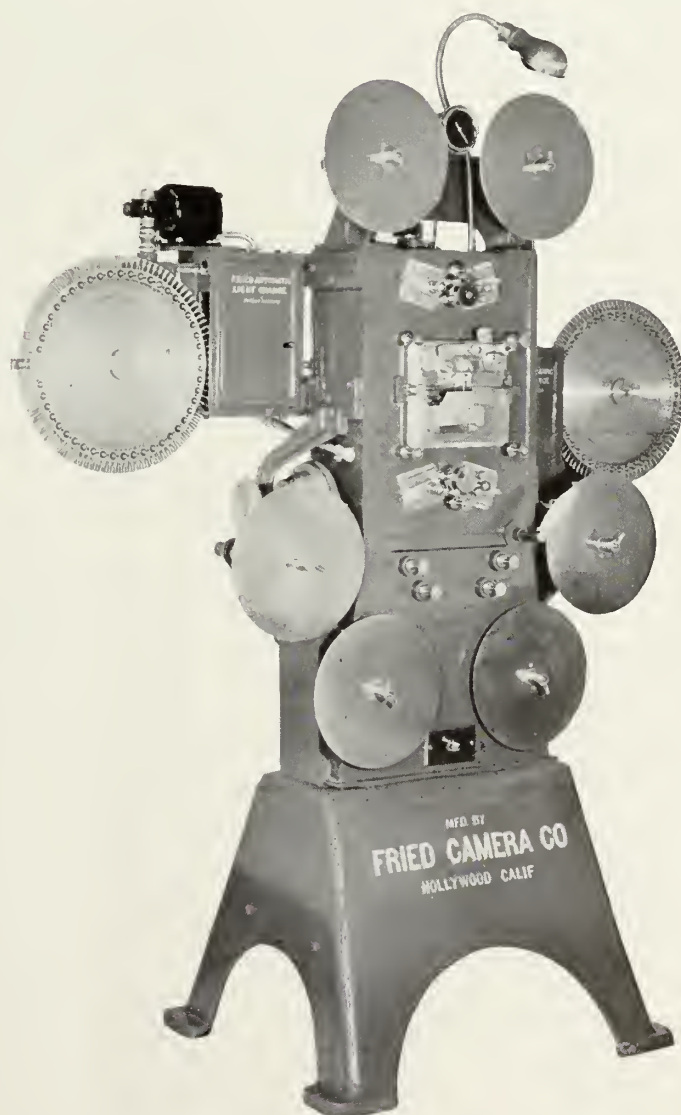
Exposure latitude is another important factor in film. In order to be able to get prints of good quality, it is imperative that negatives should record the whole range of tones likely to be encountered in outdoor and indoor subjects. The three new Kodak films are especially prepared with this in mind. The films are coated to in-

sure proper recording of shadows and middle tones and to give gradation in the dense highlights when exposure is full.

Even if exposure exceeds the normal level by a wide margin, negatives of good printing quality will result. It is possible to overexpose these new Kodak films to the extent of one hundred times the minimum exposure necessary to provide a reasonably good print. Of course, such overexposure should always be avoided if the finest grain is required.

M-R Introduces Duarc

THE DUARC, a radically new twin-arc broadside, is announced this month by Mole-Richardson. Features of the new lamp include a completely new, self-controlled automatic carbon feed sys-



The Fried bipack color printer. (Page 4, Column 3)



ing a burning period of over two hours without retrimming; silent, flickerless operation; new heat-proof Pyrex diffusing system; and interchangeable operation as a floor or overhead unit.

The new unit replaces the firm's previous Six Arcs and Scoops, which were the first units developed for three-color Technicolor and at the time considered revolutionary advances over previously known broadside arcs. Though they were efficient light-sources, their burning period was unduly short for efficient production, being but 40 minutes without retrimming—a distinct inconvenience where large numbers of these lamps were used, as on Technicolor sets, for overhead lighting.

The new Duarc was developed primarily to overcome this fault. A radically new method of feeding the carbons had to be devised and in the Duarc, each of the arcs is fed individually by a separate automatic feed mechanism while the arcs themselves are in series. Each feeding mechanism is driven by a special low speed electric motor which requires only 60 revolutions to feed a complete trim of carbons. Each motor is governed directly by the voltage drop of the arc it feeds. In this way the carbons are fed at a rate directly controlled by the rate at which they are consumed, in effect, a self-metered feed.

This feed is remarkably efficient. Not only is the burning period without retrimming extended in excess of two hours, but the carbons are burned down to stubs but two or three inches in length.

The practical value of this new feed is that batteries of Duarks, whether used in floor or overhead service, if reasonable care is exercised to turn the lamps off during non-productive periods, can be burned from morning to noon on a single trim, or even in some cases operate without retrimming for a full day's shooting.

The same mechanism serves as an automatic striker, adapting the Duarc to remote-control operation, either singly or in groups. When the main switch is thrown, the arcs are automatically struck and self-adjusted to the most favorable arc-gap. Thereafter they burn automatically until current is cut off or the entire trim is consumed.

The automatic feed further serves to virtually eliminate flicker. Ultra-sensitive photoelectric recording meters chart the burning of a Duarc as an almost perfectly straight line. Fluctuations in light intensity are not visible to the eye or to the camera.

Motors and carbon-feeding mechanisms are placed well away from the arc itself, and thoroughly insulated acoustically and thermally. Ample ventilation is provided, so that the rear of the lamp, through which access is gained to the mechanism, need seldom be opened on the set.

The reflecting system is of familiar type, consisting of a curved shell of polished metal, with suitable apertures through which the carbons protrude. Unlike previous twin-arc units, in which the ends of freshly inserted carbons sometimes projected outside of the reflector housing, the carbons of the Duarc are wholly within the lamp's housing. Similarly, the ballast resistance, which in previous floor-type broadsides was a separate unit, mounted on the lamp pedestal, is in the Duarc contained within the lamp housing, making the unit completely self-contained.

An important development is the introduction

Top, front and rear views of the new Mole-Richardson Duarc (Page 1, Column 3); Center, the new Ampro sound on film projector (Page 5, Column 1); Bottom, the new model Coinometer (Page 5, Column 3).

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

Editor, ED GIBBONS; Managing Editor, HERBERT ALLER; Art Editor, JOHN CORYDON HILL;
Business Manager, HELEN BOYCE.

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J. N. A. HAWKINS, PAUL R. CRAMER, WILLIAM COMYNS.

VOL. X.

Contents for September, 1938

No. 8

On The Cover: As sensational an action shot as one could want, is this photographically and pictorially impressive scene, a dashing western climax. Note the hero's white horse and heavy's black horse, so typical of western formula. The still is by M. B. Paul, 659, IATSE, for Columbia's "Song of the Plains."

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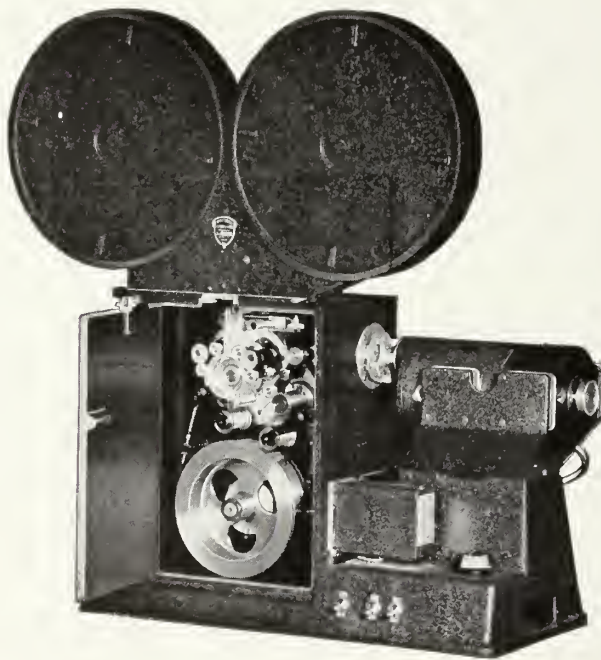
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of heat-resistant Pyrex in place of glass for the diffusing window used in front of all modern arcs. Due to the well-known heat-resisting qualities of Pyrex, the diffuser can now be made as a solid sheet of glass, rather than as a series of loosely mounted strips. This, together with the efficient ventilation provided, makes it possible to mount the diffuser close to the lamp. A new type of diffuser mount has been designed for this purpose. It consists of a rigid aluminum frame which slides over the front of the lamp window-fashion, fitting tightly in place but quickly removable when necessary.

No claim is made by the manufacturers for increased intensity of light from the Duarc as compared to their previous Side Arc types. Camera-men and electricians who have used the lamps in practice, however, report that they consistently obtain more usable light with a Duarc eight feet away from the subject than they do with previous broadsides at half the distance.

The new Duarc can be burned in virtually any position, and can be used interchangeably either as a floor lighting unit or as an overhead "scoop." For overhead use, special overhead hangers, fitted with safety chain locking devices, permit hanging these lamps in groups, operated by remote control. For floor use, a new two-lift pedestal has been provided to give the lamp an unusual range of adjustments, running from a low position with the light-center but four feet six inches from the floor, up to a high position placing the center of illumination eight feet clear of the floor. The usual yoke-type tilt-head is provided.

Fried Step Printers

FRIED REGISTRATION Step Printers are available in two models. The Standard model is designed to meet such critical printing requirements as are not to be satisfied with a continuous printer. It permits the making of lavenders and dupe negatives without sacrificing the quality of steadiness, registration and definition of the original negative. It is unexcelled for the making of key prints for background projection and similar process work. The Bi-Pack model has been designed to meet and fully satisfy the problems and requirements associated with the printing of two negatives against a single double coated positive film. It may also be used in the same manner as the standard model for black and white work.

Extremely critical registration and contact are attained through many exclusive features of design and precision construction. The film movement has pilot pin registration and releasing pressure plate.

Both the Standard or Bi-Pack model can be furnished with either of two types of Fried shutter light changes, the semi-automatic or fully automatic type. The Bi-Pack model utilizes two light changes for the critical balancing of light values from each negative. The Standard model has similar constructional features to the Bi-Pack model, with the exception that it requires only one light change. The Fried shutter method of lift control provides perfect and instantaneous light change without effecting or altering the color of actinic value of the printing light, and most effectively meets the requirements of color and black and white printing.

B & H Candid Case

A NEW BELL & HOWELL Filmo 8 Candid Carrying Case is cleverly designed with a hinged "drop cover" which allows the camera to go into instant action without removal from the case. Windows are provided in the snug-fitting inner case to make every camera operating part instantly accessible. Windows on right side of inner case



B & H Candid Case. (Page 4, Column 3)

expose the footage dial, speed control dial and winding key. A window in the rear matches eye position of the spy-glass viewfinder. The left side window reveals exposure calculator. With drop cover down in front, the viewfinder, lens and starting button are completely in the clear for action and use.

Both inner case and drop cover are made throughout of double-thickness, full-grain cowhide. The color is known as Bombay, a rich dark brown. The all-linen thread stitching in goldenrod color creates a classy, decorative trimming. Fastener and buckle attachments are nickel-plated.

Illustration on Page 5 shows the three phases of action: 1. Ready starting position, case closed. 2. Hinged cover quickly unsnapped and swung down, making camera ready for action. 3. Action—Camera remaining in case.

Retail price of the case as described above, complete with adjustable shoulder strap and swivel attachment is \$6.

Ampro Projector

A NEW AMPRO-ARC sound-on-film projector, claimed to have five times the brilliance of the ordinary 750-watt projector is announced by the Chicago 16 mm manufacturing firm. Complete equipment consists of the following major components, designed to operate on 50-60 cycle current, varying from 100 to 125 volts.

Projector unit, 1600 feet reel capacity; large output amplifier. Output 40 watts undistorted; high intensity arc lamp, automatic carbon feeding; full wave rectifier; stand with swivel attachment for locating picture; two torpedo speakers with tripod stands. Cables and accessories furnished as standard equipment; all projector, sound head and amplifier features are the same as those incorporated in the Standard Model "L".

Brownie Darkroom Lamps

TWO NEW BROWNIE Darkroom Lamps now are available from Eastman Kodak Company. The line-up on these inexpensive darkroom aids now is: Series 2, red, for use in developing Verichrome Film; Series 3, green, new, for use in completing development of panchromatic film where complete darkness is not required; Series 0, yellow, new, for use in contact printing and enlarging. Each lamp, fully equipped with 7½-watt bulb, costs only 50 cents.

Kodaslide Metal Binding

A NEW KODASLIDE Metal Binding, unusually convenient and rapid for Kodachrome slide mounting, now is supplied in eight-inch strips. The binding is U-shaped, nickel-finished brass, ready-

notched. No tools are required. The strip is simply folded around the edge of the Kodaslide cover glasses, and the ends lock together to form a neat joint. If desired, the metal binding can be unlocked and a new transparency inserted in the slide, the same binder strip being re-used. Cartons of one dozen strips of Kodaslide Metal Binding will retail at \$1, and cartons of fifty, \$3.75.

New Bee Bee Model

BURLEIGH BROOKS, INC., 127 West 42nd Street, New York City, announce a new convertible Bee Bee Negative Viewer which has a special frame for viewing Dufaycolor and Kodachrome color slides up to two inches square in addition to the regular track for viewing 35 mm. films. By using auxiliary tracks, either 8 mm. or 16 mm. film can also be inspected. Also, a 4X magnifying lens is mounted in an adjustable metal tube which may be removed and used as a low power microscope.

Leica Self-Timer

A NEW VISIBLE-ACTION, Self-Timing Device for the Leica camera is now available. The spring mechanism that trips the shutter takes from 12 to 15 seconds to unwind.

It is possible to always determine the time that remains before the shutter will be automatically released by observing the relative position of a white, circular dot on the face of the slowly rotating winding disc of the self-timer.

The Leica Self-Timing Device is compact and simple to adjust. It weighs a little more than an ounce. Should the timing mechanism be out of adjustment for any reason, the fault can be easily corrected by taking a quarter-turn of an adjustment screw which is situated in the neck of the instrument. The device swings freely on its axis for convenience in winding.

Rapid Change Maker

ONE OF THE MOST efficient coin-changing devices, the Coinometer, manufactured by the Universal Stamping Company of Chicago, now is priced at \$95. A rapid and fool-proof coin-changing device; the Coinometer is intended for use in theatres, cafes, banks, amusement parks, ticket offices, etc.

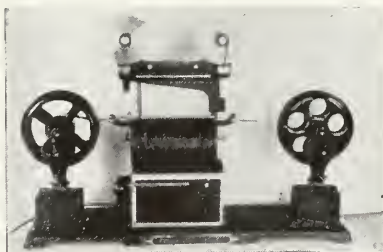
Cesco Trays

A NEW LINE of photographic developing trays and hypo fixing baths of Enduro stainless steel has been announced by the Columbian Enameling & Stamping Co. of Terre Haute, Ind. The trays, equipped with a formed pouring lip, will accommodate the three generally used sizes of paper and plates, 8x10, 11x14 and 16x20. The No. 170 hypo fixing baths are made to accommodate all paper and plates up to 11x14 inches in size. Both developing trays and fixing baths are drawn, seamless shapes made to government specifications. They are fabricated from special Enduro SMO stainless steel (No. 316 analysis), which has been found most acceptable for all types of photographic developing work.

Bessa Prices Cut

WILLOUGHBY'S complete stock of Voigtlander Bessa roll-film cameras are being put on sale at considerably reduced prices because the factory is discontinuing this model camera, in view of the tendency toward the miniature type. They

expect to replace it in their line soon with a radically new compact 6x6 cm roll-film model. Folder of prices may be obtained by writing Willoughby's at 110 West 32nd St., New York City.



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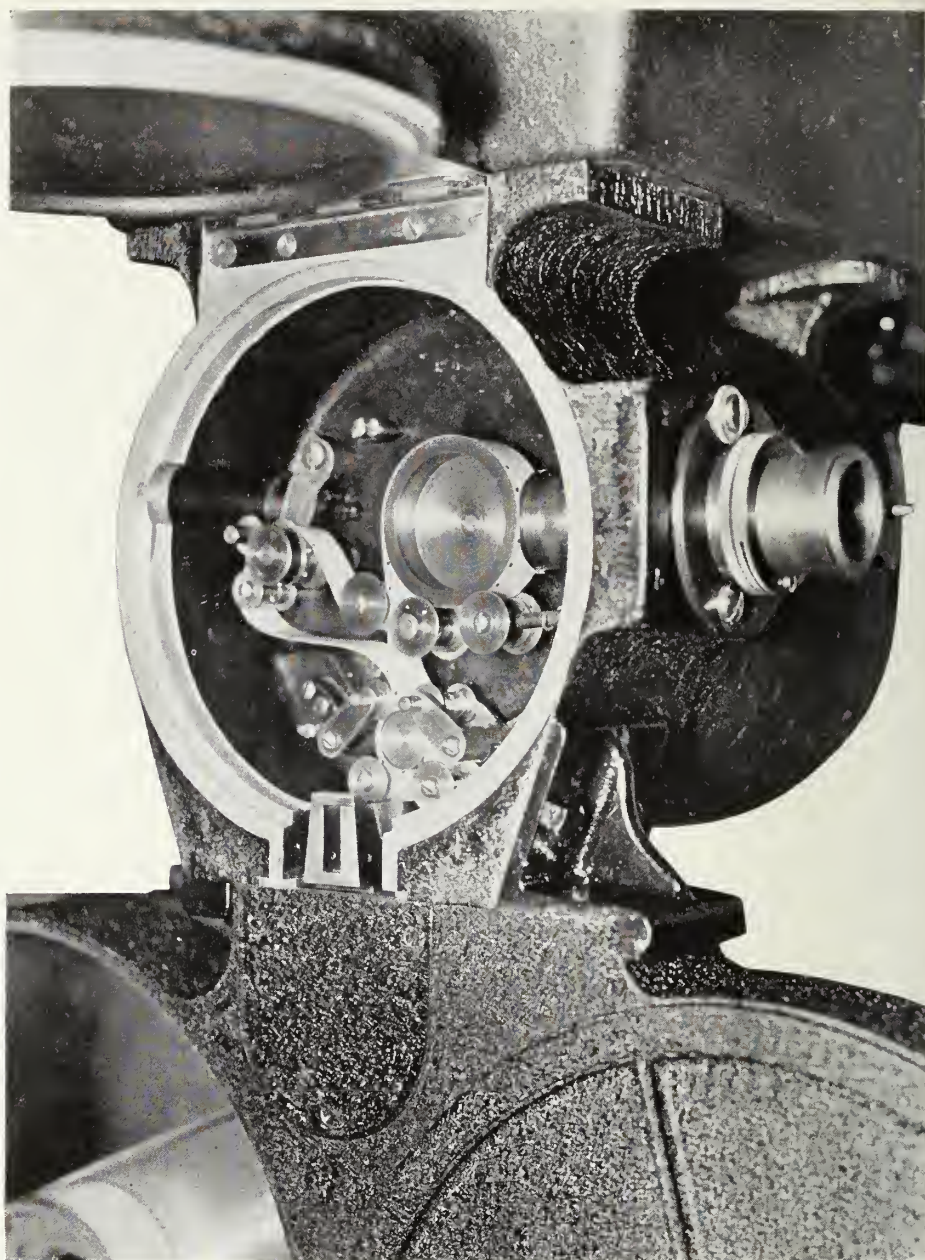
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The new Canady Recorder. (Page 6, Column 1)

New Canady Recorder

THE LATEST TYPE Canady DeLuxe 16 mm. Recorder now is available. It features ball-bearing recording drum and highly improved rotary equalizer to insure the constant speed so essential for 16 mm. work. As illustrated in an accompanying close-up shot, the new Canady recorder is equipped with recording lamp holder, fitted with genuine quartz slit that does not clog with emulsion or dirt. The new model also is furnished with a high quality galvanometer of rugged construction and high sensitivity.

As with the well-known 35 mm model of the Canady line, the 16 mm. machine can be furnished with a specially built, ball-bearing, constant speed battery driven motor for operation on 12 volts, or with synchronous motors for any specified power supply. The new model already has seen considerable service in the field in recent months with highly satisfactory results, according to its users.

Another new item in the Canady line that is

creating unusual interest is the Noise Reduction Unit. Owners of glow lamp equipment are bringing their amplifiers up to date by doing away with "B" batteries and "power packs" for glow lamp supply and installing this new unit which provides noise reduction and at the same time supplies up to 600 volts polarizing voltage to the glow lamp.

The new Canady model is furnished complete with removable 400 foot magazine, synchronous motor for any specified power supply, the improved recording lamp holder with genuine quartz slit mounted in protective shoe, footage counter and friction take-up. The 16 mm. recorder can be wide. Finish is black crackle and chrome. The glow lamp type (Model MLR) sells for \$595 f.o.b. Cleveland, and the galvanometer type (Model MGR) for \$995.

Dimensions of the new model are: 15½ inches long; 18¼ inches high with magazine; 7 inches wide. Finish is black and chrome. The glow lamp type (Model MLR) sells for \$595, f.o.b. Cleveland, and the galvanometer type (Model MGR) for \$995.

Arguscreen Kit

FROM ARGUS COMES a new low-priced combination screen kit, labelled the Arguscreen Kit. It features a CP Argus 100-watt portable projector with slide box of 100 capacity and an adjustable 10-by-32-inch screen. Complete kit with a strong case sells for \$30. Entire outfit weighs 11½ pounds.

Reeves Reductions

NEW LOWER PRICES now are in effect on Art Reeves Ultra-Fidelity Optical unit and Lin-O-Lite glow lamp. The unit now is priced at \$150 and the glow lamp at \$20. The Reeves organization is expanding their sound department considerably due to increased orders from all over the world and is prepared to cooperate with technical advice and information on any type of sound, laboratory and allied equipment for production conditions in any part of the world.

SMPE's Fall Session

ARRANGEMENTS have been completed for the fall convention of the Society of Motion Picture Engineers. It will be held in Detroit, October 1 to November 3, and the Statler Hotel will be SMPE headquarters. The program of papers and presentations is being prepared by J. E. Crabtree, editorial vice-president, and G. E. Matthews, chairman of the papers committee. Karl Brenkert, of Detroit, is chairman of the local arrangements and reception committee. Mrs. F. Strickler will be the convention hostess.

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PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

NEWS OF THE MONTH

CINEMATOGRAPHY

Ann Doran and Iris Meredith are the Columbia contract players in this exploitation shot by Whitey Schafer, member of Local 659, IATSE, for the current campaign.

Movie Campaign

Industry cooperates in \$600,000 drive to stimulate interest; outstanding stills sought.

For the first time in the history of the motion picture industry a gigantic cooperative drive of all factors of production, distribution and exhibition is under way to exploit motion pictures to the ticket paying public as an outstanding entertainment "buy." The campaign is tied in with the current release of many outstanding pictures, and centers around a \$250,000 prize money movie quiz contest. Including the prize money a budget of over \$600,000 has been laid out for advertising and exploitation.

The campaign is a recognition of the need for the motion picture industry to follow the lead of other industries in cooperating to "sell" the industry and its product generally to the general public. Not only is it expected to bring increased box-office receipts at the nation's theatres, but it also is calculated to build a cumulative good will that cannot be estimated in dollars and cents.

The part that members of Local 659, IATSE, are playing in this cooperative drive, is in producing interesting and news-worthy



Books of Tables

Due to lack of space in the current issue it has been necessary to omit the Laboratory Book of Tables, Soundman's Book of Tables and the Studio Mechanic's Handbook. Also a number of technical articles have been held for later publication.

still pictures, and in the special trailers being turned out during the campaign. One of the first stills of the drive is published herewith and in an early issue we plan to present a layout of the outstanding illustrative contributions of the cameramen to the exploitation program. Suggestions from members and publicity departments of outstanding photographic work that should be reproduced in such a layout will be appreciated by the editors of INTERNATIONAL PHOTOGRAPHER.

It also is suggested that any studio work-

ers having any constructive suggestion to make toward ideas and exploitation slants that will contribute toward the greater success of the motion picture industry's cooperative drive to boost public interest in motion pictures, submit them through the channels of their studio publicity departments, where they will receive the fullest cooperation. The studio publicity men are always on the alert for any ideas or news-worthy suggestions that can be used in the campaign or in exploiting their individual studio productions.



Newsreeling a 70 Mile Swim

The cameraman's inside story of the courageous attempt by Paul Chotteau to swim from Santa Barbara Island to Venice. *By Frank M. Blackwell, 659, IATSE, as told to Warren McGrath, 695, IATSE.*

Anxious red-rimmed eyes peer hopefully over the bow of our sixty-five foot sloop "Zarack." We have been 17 hours making a crossing of 51 miles from Venice, California, to Santa Barbara Island—a crossing that should have slipped by easily in ten hours. All of us know that the last seven hours have been spent in blindly seeking the mile long wisp of land in a murky fog that has persisted all night. We kid each other about being lost—and yet it's an eerie feeling knowing you are helpless out there 'til the fog lifts or something less pleasant happens. But we are anxious for another reason; we are bringing Paul Chotteau to Santa Barbara Island for the start of his epochal swim to the mainland.

Our human seal as we affectionately dub him, first saw the light of day 40 years ago under the very shadow of the Eiffel Tower and for the past nine years has been a naturalized nephew of Uncle Sam. Since taking

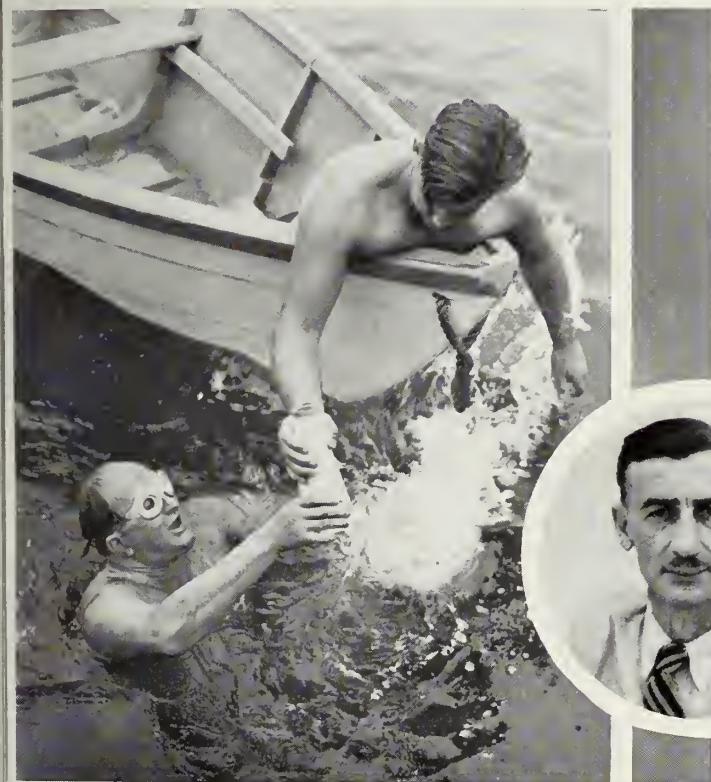
up his residence at Venice, the psuedo calm of the tricky waters of the Pacific between the Channel Islands and the mainland has flaunted a constant challenge. Six times during a single year ending in July 1936 did Chotteau accept that challenge in attempting to swim the treacherous 44 miles between Santa Catalina Island and Malibu Beach. After five failures, an exhausted but supremely confident Chotteau flung himself from the boiling surf at Malibu with that accomplishment securely tacked to his name and 34 hours of grueling punishment to erase from his body.

Last December Chotteau began a rigorous program to condition himself. His lonely swims in the chill Pacific waters were marvels of endurance, yet each day he would say "Non—it's not yet time"—and return home to the consolation of his violin. Monotonous months of this passed until on Saturday, July 16th, Chotteau announced him-

FASTEST MAN ON EARTH is the title of Capt. George E. T. Eyston, retired English army officer and when he headed for the Bonneville, Utah, salt flats to hurl his seven ton automobile, "Thunderbolt," at the unprecedented speed of 347 miles per hour, the newsreels photographers were on hand to cover the story. Upper Left, Capt. Eyston uses a specially mixed preparation for his fuel and is shown supervising each gallon that goes into the tank. Upper Right, Irby Koverman, Local 659, IATSE, newsreel cameraman for Movietone News (left) and Paul Heise, of 695, IATSE, his soundman, are on the job in the blazing heat to get a complete sound and picture record of the yarn. Bottom Left, mechanics are still busy making final check as Capt. Eyston (with helmet and goggles) climbs into the speedster; Lower Right, the "Thunderbolt" is pushed up the salt course flats course by a motor truck for the start of the speed trials that made front page news last month.

self ready. During his training period he had consumed 36 gallons of cod liver and halibut oil. His weight had increased from 204 pounds to 235 pounds.

I feel quite lucky to have been chosen official photographer for the swim. With any kind of a break it ought to be a swell news story. Here we are, straining our eyes for something that looks like terra firma in



Shots of Paul Chotteau's attempt to swim from Santa Barbara Island to Venice, California, with dramatic close-up of rescuers finally pulling him from water after 70-mile swim. Circle, Frank Blackwell, Local 659, IATSE.

the kind of a pea soup fog that clings. Harvey Walters, our swim manager, is first to sight land and we cautiously poke our way to the rocky cove that marks the starting point. We all pile into a small dory to take us shoreward and after speedy preparations consisting mostly of a generous body greasing, Chotteau enters the water at exactly 12:45 p.m. I use the Akeley for some swell shots on the island and manage to grind on him until he had swum quite a distance out, before going back to the "Zarack" for the scenes en route.

Now we are alongside of Chotteau watching the long powerful strokes from the comparative safety of the dory. The fog has lifted somewhat, which eases the strain of watching for the dreaded sharks. Chotteau

rests occasionally by drawing his knees up and actually sitting in the water while floating. This is good stuff for the reels; with his white water goggles, Chotteau resembles a giant frog in the water. I'm getting a swell 4" closeup of this when Harvey Walters' sharp cry is heard from the bow. He has sighted our first whale. It's only a pup

though and after splashing around once or twice is seen no more. I've missed a good shot. Right then I drop everything and load the trusty Eyemo; if any more whales show up, they're going to be on film.

Chotteau is calling for food. Walters prepares the "formula," which has as its principle ingredients, dextrin, maltose and milk,



Not all speed strips require candid cameras, as this excellent series of speed graphic shots by Virgil Apger, member

and hands it to him in a paper container from the side of the dory. More methodical swimming, almost noiseless. We are looking at each other now with constrained glances for the extremely slow speed causes the boat to wallow in the high seas. One or two are unashamedly seasick—but I'm lucky, so far. Another shout, and now Chotteau is splashing furiously. Two sleek gray bodies with upright fins veer suddenly from the course straight at Chotteau and, turning over, scrape their barnacle laden bellies on the keel of the "Zarack." Our consuming dread, the sharks, have sighted their prey and from now on it's every man on the alert.

The encounters with whales, blackfish and sharks became quite commonplace after that. I grind plenty of footage on them. One swell shot was of a whale actually resting his head on the stern of the dory and blowing his breath at us. Had we smell equipment to record odors that piece of film would surely have been deleted. Whales in general are afflicted with halitosis but this one was Public Offender Number 1. Once a shark bolder than the rest lunges straight at Chotteau. He splashes furiously and the shark darts away. We relax for a minute but Chotteau starts yelling—now he's splashing and kicking furiously but still the fin keeps coming. Walters makes lunges with the boat hook—but Chotteau gives a great cry and beats the water about him. The shark has finally been frightened away but not before it has scraped its body along Chotteau's legs—and not before our human seal has seriously strained the ligaments in his right arm by his frantic thrashing.

We are a gloomy crew now. Our champion is swimming with one arm. The other drags uselessly. It's dramatic stuff for the reel; but we all are feeling each pain laden stroke he takes. He can't last much longer it seems and we are only little more

than half way. It's dark nighttime and the water at this point is bitterly cold. Rests are more frequent now and the strokes get slower and slower. Phil Daubenspeck, life guard at Venice stands ready for instant action on the deck of the "Zarack." The night drags on.

A murky dawn arrives on Monday. Our admiration for Paul Chotteau is of the greatest. Here, I resolve, is the man who can take it. The cold gray light of the fog filtered sun reveals a face gray with the pain of suffering. The same light reveals many green faces alongside of me on the "Zarack." Phil Daubenspeck plunges in from time to time and swims with Chotteau to keep him company. Foot by foot we drag ourselves over the Pacific. My eyes feel like two burnt holes in a blanket. We check constantly with our navigator but the "Zarack" seems to hold a true course. Where the deuce are we anyway? Six o'clock, seven, eight, nine pass. The strokes seem barely enough to keep him afloat. We are frantically berating our navigator. Something **MUST** be wrong.

I'm grinding away just for "coverage" when I hear a splash alongside of me. I look up, still grinding, everybody is excited. I look through my finder again but I can't see Chotteau. Unconscious, our champ had SUNK. Phil Daubenspeck has to dive in and rescue him many feet below the surface. We haul him aboard slightly revived but all in. Our swim was ended in failure but its been one of the most glorious battles man ever waged against the elements.

Dr. George Clark, our attending physician, is busy now with his stethoscope on the inert form of Chotteau. He is conscious now and protesting with increasing vigor the efforts we made to "rescue" him when he sank. In that busy half hour the fog lifts and our eyes focusing shoreward perceive, barely five miles away, the row of trim cottages marking Malibu Beach. We are miles from our destination but the "Zarack" has held a true course during the entire trip. The swift current had moved us 48 miles parallel to the coast and had forced our human seal to swim 70 miles instead of the 51 miles originally planned, 44 hours and 56 minutes for a 70 mile swim through shark infested, treacherous and at times, bitterly cold waters of the Pacific—not bad!

Chotteau was resting comfortably in the Santa Monica hospital when I saw him next. Back to his normal weight of 205 pounds he looked fit enough to try it all over. His blue eyes twinkled when I asked him if he would try again.

"Young man," he said, "I will not say." Here he paused while he grasped my hand. "But I'll tell you something," he continued, "it can be done."

And I have just that much confidence in Paul Chotteau that I will have an additional camera on the beach at Venice to make him emerging from the surf at the completion of his next attempt.

IN MEMORIAM

King D. Gray	1886-1938
659, IATSE & MPMO	
Clarence Hewitt	1901-1938
659, IATSE & MPMO	
Robert V. Doran	1890-1938
659, IATSE & MPMO	
Robert Morton	1900-1938
659, IATSE & MPMO	



TSE, shows. Shots are of Ray Bolger in a dance sequence in MGM's "Sweethearts," Eddy-MacDonald starring pic.

NEW BOOKS

Two new books of interest from Eastman Kodak were available last month. "Photography by Polarized Lights," priced at 50 cents, discusses various types of Polarscreens, their effects, plus data on exposure time, filters, accessories and negative materials to be used with this type of photography.

"How to Make Movies," a very complete, authoritative and well-illustrated volume, sells for \$2. It is written in simple, understandable style, covers thoroughly the angles of 8 and 16 mm cinematography and while it passes up considerable technical and background information otherwise available, is a valuable handbook for the average amateur cinematographer.

Another handbook of interest to both amateur and professional still photographers is "Prices to Charge for Photographs," by H. Rossiter Snyder. It is published by Fomo Publishing Company at 50 cents, and is one of a series of booklets from this house.

One particular phase of amateur cinematography, "Featuring the Family," is dealt with thoroughly and interestingly in a 36-page booklet issued last month by the Amateur Cinema League. The author is James W. Moore.

Agency Film Department

Another development in the progress of commercial motion picture production was announced last month by Stanley Resor, president of J. Walter Thompson Company, international advertising agency, that the company have created a new department to present commercial motion pictures for its clients. The new department is headed by Fred Fidler, with headquarters in New

York, and the possibility of a branch office being opened in Hollywood later.

The J. Walter Thompson Company already has made a number of commercial motion pictures, one in Technicolor. While here, Resor revealed that of the 14,000 sound equipped theatres in the United States, about 7,000 are accepting commercial films, and that more than \$15,000,000 today is invested in commercial film production.

Effects Spectacles Due

Roach leads in plans for "Lost World" type of picture using latest process methods.

Hal Roach appears to be jumping the gun in a new cycle of spectacular stories of the

type of "Lost World" and "King Kong" that appears on the screen horizon. Producers are deciding to take advantage of the many sensational strides made in the technical fields of rear projection, miniature and special effects in recent years. While RKO-Radio and Columbia are reported working quietly on plans for such pictures, Roach already has announced production of what is described as "a screen saga of primitive humanity," to be titled "When Man Began."

Six months of quiet preparation were spent by the studio's process department, headed by able Roy Seawright and Frank Young (Int. Photog., Dec. 1937) in developing methods for successfully reproducing the animal and reptile life of prehistoric days before the production was announced. Roach plans to line up a cast of "names" from the sports world for featured roles.

PHOTOGRAPHY

Koffman's Mystery Effect Stills

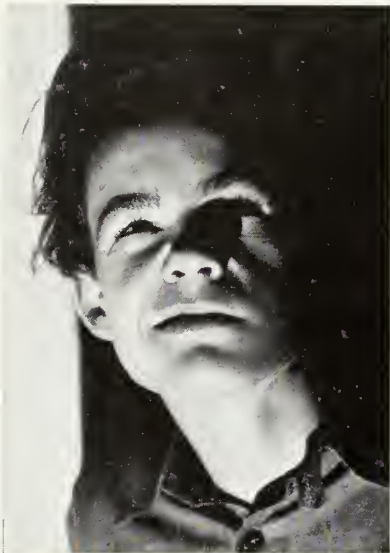
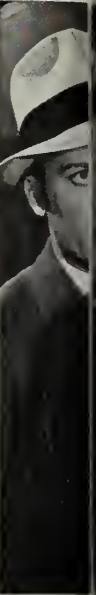
Unorthodox lighting is the secret of obtaining menace and horror photographic effects to illustrate dramatic highlights of films of mystery and adventure.

By Herbert Aller

Closely allied to the silhouette type of picture, which was so ably illustrated in the collection of photographs by Durward Graybill, member of Local 659, IATSE, in the July, 1938, INTERNATIONAL PHOTOGRAPHER, is the mystery and macabre effect type of shot. Both types depend upon unorthodox lighting. Whereas the silhouette

depends almost entirely on back-lighting, obscured by the figure or object to be silhouetted, sinister effects are obtained by meagre cross-lighting and low-lighting.

Production of stills for the independent and major "B" pictures calls for such effects more frequently than in any other pictorial exploitation, because these pictures

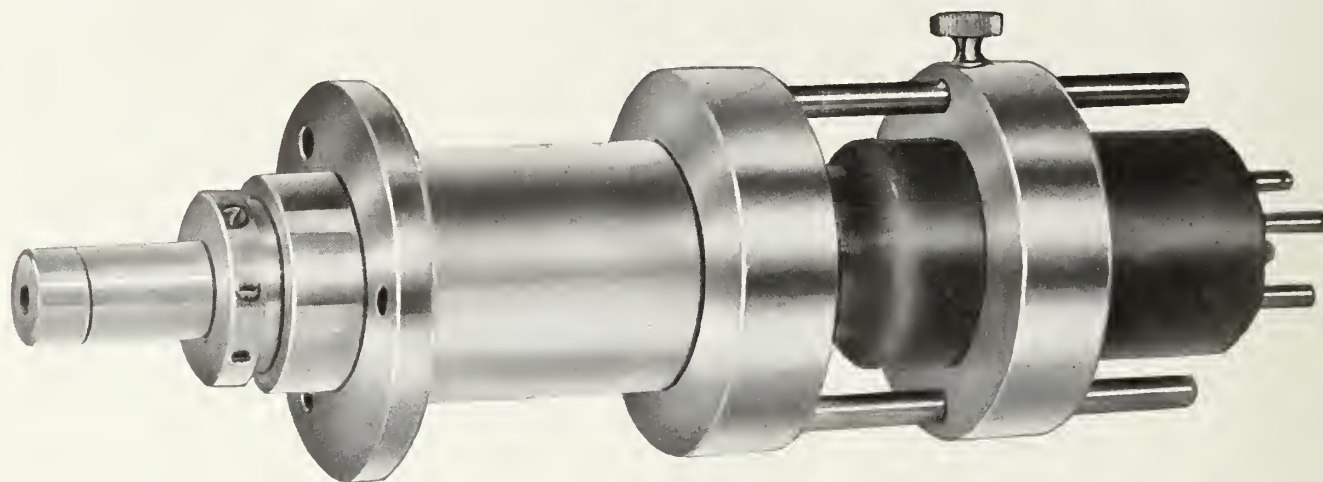


Mystery and horror effect shots by Jack Koffman,



E, described in story on Page 13 by Herbert Aller.

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frequently feature adventure and mystery story angles. An expert member of Local 659, IATSE, in this field of menace and horror is Jack Koffman, whose work is illustrated in the layout on Pages 16-17 of this issue of INTERNATIONAL PHOTOGRAPHER.

Most of Koffman's pictures shown herewith were made for Larry Darmour's productions, which are released by Columbia. Koffman tells me that he rarely uses more than one light for such effects. They are placed low, or to one side or the other of the actors, almost always at some slant. Koffman points out that this type of shot requires more than ordinary cooperation from the players, and says that the pictures illustrated are excellent illustration of the willingness of most players to "play ball" with the stillman. Since this type of stills must generally be obtained in moments when the actors are in character—and must be sandwiched into spare moments during rapid production schedules—Koffman usually works in an improvised gallery near the

actual set where shooting is under way.

Eyes and hands are most important in getting effective shots of this type. The photographer should always have some general scheme in mind, but must use judgment in fitting in with the actor's ability to catch a mood of mystery or fear. Consequently ground glass focusing is essential and Koffman prefers to use an 8x10 Ansco camera. All the pictures illustrated were made on Agfa Superpan Press.

Koffman agrees with George Hurrell and others who have expressed themselves in the past in INTERNATIONAL PHOTOGRAPHER, that too much technical mumbo jumbo interferes with good pictorial work. He doesn't use a light meter, and prefers to judge his effects by the accumulated experience of trial and error, rather than a welter of mechanical computation. He, therefore, prefers a few favorite stops and shutter speeds and is quite conservative in this regard.

Another major point he emphasizes is that while props are valuable, particularly when

placed between the light and actors such as in the accompanying jail and stair effects, great caution must be used in avoiding any extraneous detail, that might detract from the general mood.

Kalart Service

A free advisory bureau on all problems of flash and newspaper photography has been set up by the Kalart Company, manufacturers of the well-known synchronizer and range-finder. Experienced members of the Kalart staff will cooperate in solving any bugs in connection with this type of photography. The Kalart Company also wishes to call attention of all studio stillmen members of Local 659 to the fact that they have rapid repair service available from their Hollywood headquarters in the Taft Building.

As Standard as the
AMERICAN MOVIE

MONTH-AFTER-MONTH check-ups invariably show that the bulk of motion picture productions are filmed on Eastman Super X. Prime reason is consistently superlative photographic quality. Like the American motion picture itself, Super X is the world's standard of excellence. Eastman Kodak Co., Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN *SUPER X*
PANCHROMATIC NEGATIVE



BIG

"Can't Take It With You"

"You Can't Take It With You," Frank Capra's latest Columbia production, is a picture that should be prescribed as essential mental treatment for the currently widespread manifestations of human ego in its warped and distorted forms. Dictators, war-mongers, political and business worshippers of power and bombast should be forced to sit through the picture time and again until its human, sane, thoroughly entertaining story had cleansed them of their crackpot illusions.

Yet the picture is in no sense a preachment. That is its most telling value. It is thoroughly and showmanly 100 per cent entertainment. Grandpa Vanderhof and his re-educations of Banker Kirby to a saner viewpoint on life teaches a lesson and sells the viewpoint of common sense philosophy far more effectively than any of the tub-thumping, dogmatic self-appointed panacea experts of the day just because it is down-to-earth entertainment.

Frank Capra, with his direction, the entire cast with fine performances, Robert Riskin with a worthy cinematic treatment of the George Kaufman-Moss Hart Broadway hit, all share in giving the picture values that are timely and memorable.

The contributors to the motion picture version have succeeded in introducing qualities and values far superior to the play version, according to all who have been in a position to make a comparison. New characters, new scenes and newer and stronger dramatic situations have been introduced in most effective camera story-telling technique that take the story far deeper into the realms of human character and emotion than did the proscenium-limited stage play.

In any listing of "Big Pictures," Columbia's version of "You Can't Take It With You" must be given high ranking. What faults it may have of extraneous matter and misplaced emphasis as evidenced in its preview were minor as measured against its sterling qualities. Pre-release editing will undoubtedly correct these trivial slips.

The picture is of the sort that through every moment gives the feeling that every participant in its production thoroughly enjoyed the job. It should have a heartening effect on every sincere worker in the motion picture industry who believes that new horizons of constructive contributions still are wide open.

Because Director Capra has succeeded particularly well in perfectly balancing an array of excellent character portrayals such as has seldom been approached in motion picture history, our pictorial layout on "You Can't Take It With You," this month fea-

PICTURES

tures in addition to highlight scenes of the film, still studies of the important cast members. These are part of the excellent collection of still pictures assembled for the film by Whitey Schafer, member of Local 659, IATSE, and his staff in the Columbia still department.

Illustrated on these pages are highlight scenes from the production. At left top is the memorable scene where Grandpa Vanderhof (Lionel Barrymore) pauses before the family dinner to address his impressively human substitute for the conventional grace. Center is a sequence climax scene where G-men arrive to arrest the entire clans of Sycamores and Kirbys through a hilarious mistake. At lower left is the highlight scene of the court-room sequence, when Alice Sycamore (Jean Arthur) "tells off" Tony Kirby (James Stewart) because of his parent's snobbish and intolerant attitude, which is contrasted strongly against Grandpa Vanderhof's friendly, though unconventional viewpoint.

At top right is the scene between Kirby, Sr. (Edward Arnold) and his son in which the son expresses his smoldering resentment against the stuffiness of his bank job and his father's campaign to corner the munitions market, when the boy asks his father whether he has "overlooked the sling-shot monopoly?" Center right, Kirby has accomplished his dream of power, but in the midst of his triumph has lost his son. Lower right, Kirby leaves the expectant business big shots to go to Grandpa Vanderhof for help in the problem that is too much for him; and in perfect character, Grandpa Vanderhof solves the entire situation merely by getting Kirby to play a mouth organ duet.

The story is essentially one of the contrasts and conflicts between a family of wealth and social position, snobbish and power-mad, against Grandpa Vanderhof's uninhibited and irrepressible brood, whose motto is "live and let live and do what you really want to." The dramatic developments center around the love affair of the boy and girl, but the real story and the acting triumphs of the picture belong to Barrymore and Arnold as the heads of the respective families. Both give magnificent portrayals, and Capra has logically placed the story's climax in the hands of the two able character actors with dramatically telling results.

On Page 20 are the principal players, topped by Director Capra and Cameraman Joseph Walker, whose photographic job is first rate. In the left strip are Miss Arthur and Stewart; Donald Meek as Mr. Poppins, "who makes things," and Halliwell Hobbes as Mr. DePinna, the ice-man, who stayed to engage in the delightful pastime of creating bigger and better fireworks effects with Mr. Sycamore. Top strip shows Barrymore and Arnold in their famed duet; Samuel S. Hinds as Mr. Sycamore and Spring Byington as



Mrs. Sycamore, who writes plays because "somebody delivered a typewriter by mistake one day." Center strip shows Eddie Anderson as the enthusiastically pro-WPA husband of Lillian Yarbrow, the family cook; H. B. Warner, as the financier, who is ruined by Kirby's monopoly scheme; and

Ed Carmichael as Dub Taylor, the ex-Alabama football player, who plays the xylophone and prints Communistic literature, so he can practice setting type. Bottom strip: Charles Lane as treasury department man who shares a hilarious income tax scene with Barrymore; Mischa Auer as the genially misanthropic Russian dancing teacher; and Ann Miller as Dub's wife, who divides her time between making candy and ruining the terpsichorean art.

Not shown are Harry Davenport, who contributes an outstanding performance as the police court judge, and able supporting players Mary Forbes, Ann Doran, Clarence Wilson, Joseph Swickard, Jimmy Burke and

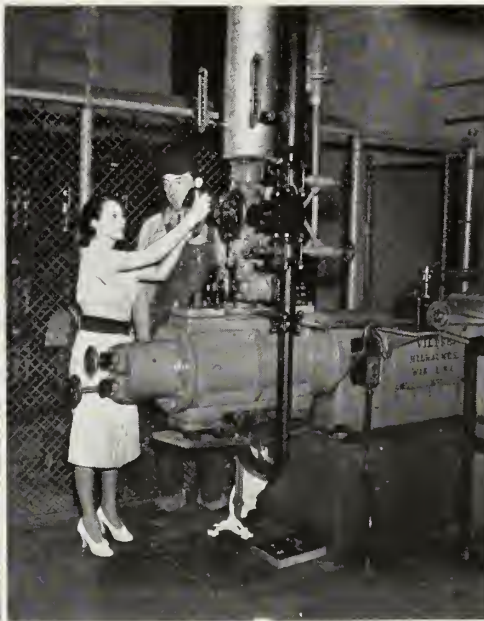
Bodil Rosing, who all handle minor roles effectively.

Kruse Joins Cinecolor

In line with their present expansion policy, Cinecolor Inc., has appointed J. Henry Kruse sales manager in charge of their studio division, effective September 1st. Howard C. Brown, Cinecolor vice president, takes over the firm's industrial department.

Kruse is a charter member of Local 659. A cameraman since 1920, Kruse during the past two years has had his own camera rental business, and has produced a number of industrial films and a series of screen tests.





SOUND

Air-Conditioned Sound

Paramount sound department sold on benefits of rigid temperature control of recording conditions after thorough experiments; another instance of delicate values in new type sound methods.

Air-conditioning, valuable on stages, in laboratories and theatres, now makes a contribution to sound recording. At Paramount, Loren L. Ryder and his sound department have gone thoroughly into the benefits of air-conditioning in recording and are thoroughly sold on it.

"We have discovered through experimentation that musical tones travel differently in different types of atmosphere," Ryder says. "In the sound-sealed recording rooms, the temperature and humidity of the air have been shown to have marked effect on the quality of the music played in these rooms. Tremendous strides that sound equipment has taken in recent months make these seemingly minute variation extremely important. The new recording equipment is so sensitive that the slightest blur in reception is noticeable on the sound track. To handle this problem we now are making our own weather. Research has shown that the 50-piece Paramount recording orchestra is at its best in a special mixture of air containing 55 per cent constant relative humidity."

This constant is maintained by washing and cooling the air for the recording room, heating it to the proper temperature by a 24-hour gas furnace, and pouring it into the sound-proof, air-tight room where the orchestra plays.

Air-conditioned music is particularly important for the brass instruments, though it makes a difference in the tonal quality of

music from the strings and reeds, and even the percussion instruments. The density of the wind in the trumpets, trombones and saxophones has a definite effect on the product.

"During our recording of music for 'The Texans' we had a good demonstration of the importance of our air-conditioning," Ryder said. "A campfire singing scene in this picture required the presence of Joan Bennett and Randolph Scott on the scoring stage. Neither was familiar with our new recording technique. When we went to lunch, Randy lingered for a moment, left the door open. As a result, the air was changed. We failed to check the humidity on our return, and recorded a scene."

"The playback was so lacking in the brilliance of the other playbacks on this score that we thought something had gone wrong with the equipment. But the trouble was soon traced to the unconditioned air."

ERPI in 16mm

Major electric's entry into sub-standard field seen as another important progress step.

One of the most significant developments in the march of progress in the sub-standard field was last month's entry of Electrical Research Products, Inc., into the 16 mm sound recording field. With RCA and ERPI both

Engineer E. H. Peters explains to Paramount contract player, Tuana Walters, the operation of the furnace and machinery which air-conditions dialogue, music and sound under a new method developed by studio sound department to meet demands of new modern recording technique.

now admittedly recognizing the importance and the sales possibilities of the sub-standard field, another vital link has been forged in the chain of progress that now is putting 16 mm on a technical par with 35 mm.

ERPI exploitation claims that their new machine will permit sound technicians to record 16 mm negative with the same facility and quality as is presently possible in the studios with 35 mm stock.

This step along with the work of other companies such as DeVry, Ampco, Canady, Art Reeves in the sound field, and the active though not yet widely publicized work of the emulsion manufacturers in the sub-standard film field, assures that within the near future, the commercial, semi-professional and even professional product will be able to use 16 mm to its fullest advantage.

The fact that scores of auditoriums, halls and other meeting places usually smaller than the average motion picture theater are using motion pictures for many purposes, in addition to the fact that motion picture theatre construction of the future will tend toward the smaller and more intimate type of house, opens up wide possibilities for sub-standard production and exhibition. The latter trend is clearly indicated in the theatre survey report of the Society of Motion Picture Engineers, published in full in International Photographer's July, 1938, issue.

Informed trade circles are wondering whether ERPI plans the same sort of exploitation drive to sell modern sound in sub-standard field as accompanied the first rush of sound to major motion picture production a decade ago. The new recorder is seen as only the first move in a complete equipment line for sub-standard production and exhibition.

There are few manufacturing organiza-



POSTER BECOMES MODEL when Paramount producer Harlan Thompson delved into his collection of private odds and ends to dig up a poster he picked up in Hungary some years ago as suggestion for wedding gown for Franciska Gaal in Paramount's "Paris Honeymoon." The poster picture supplied the answer to the wardrobe department's problem of working out an original yet authentic design. As illustrated in this effective shot from the Paramount still department, which we unfortunately were unable to identify for proper credit, Miss Gaal herself a Hungarian, closely resembles the conventionalized damsels portrayed by the Hungarian poster artist.

tions in sound, camera, film, accessories, etc., who are not devoting much time to thorough and intensive investigation of immediate possibilities in turning out sub-standard equipment on a par with that now available for 35 mm production. And the recognition of the field by the major sound and film companies is interpreted as assurance that there will soon be more specific results from the current under-cover activity.

New Weston Speed Chart

Embracing not only the several new ultra-fast films, but also first recognition of varying standards of development and gamma in different types of film usage, a completely new table of emulsion speed values has been published by the Weston Electrical Instrument Corporation. The new chart is available free through all photographic dealers.

The new chart lists the various plates and films in ten groups, according to usage. Groups include Rolls and Packs; Miniature Camera Films; Press; Portrait; Commercial; Process; Graphic; Aero Film; 35mm. M.P. Film; and 8mm. and 16mm. M.P. Film. Emulsions used in more than one type of service accordingly get multiple listing, often with greatly varied speed values.

Ratings in Roll and Pack category are based on standard commercial procedure—5 minutes in DK50 developer. Miniature camera values are based on development to a gamma of .8 in the fine-grain developer recommended by manufacturer. Press ratings base on gamma of 1.2. Portrait ratings are based on a gamma of .9, while commercial ratings use a gamma of 1.0. Process rating is based on gamma of 3.0, while Graphic ratings call for a gamma of 7.0 and reading using the "O" position on Model 650 calculator and reading from white card. Aero film ratings use gamma of 1.2.

TECHNICAL ARTICLES

New Eastman Exposure Ratings

Electric exposure meter data on Eastman's new line of miniature camera films, designed especially for amateur needs and on the market this month.

Electric exposure meter ratings for the new Eastman candid films, described in this month's Tradewinds section, were released last month by the Eastman Company. They are:

For Weston Meters:

	Daylight	Tungsten
Super XX . . .	80	128*
Plus X	40	64*
Panatomic X . .	24	40*

For General Electric Meters:

	Daylight	Tungsten
Super XX	128	80
Plus X	64	40
Panatomic X	40	24

*The use of these numbers will give somewhat less dense negatives, preferred by many workers. Ratings for the General Electric Meter may be increased proportionately.

The values in the left-hand columns do not represent the least exposure which will give the best possible prints. They include a safety factor to take care of variations in the use of the exposure meters and in

The CINEMATOGRAPHER'S BOOK of TABLES

By Fred Westerberg

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CHECKING VELOCITY

VELOCITY		DISTANCE TRAVELED			
Miles Per Hour	Feet Per Second	5 Feet	25 Feet	100 Feet	1 Mile
ELAPSED TIME IN SECONDS					
1.00	1.467	3.40	17.0	68.0	3600
2.00	2.933	1.70	8.5	34.0	1800
3.00	4.400	1.14	5.7	22.8	1200
4.00	5.867	.85	4.3	17.0	900
5.00	7.333	.68	3.4	13.6	720
6.00	8.800	.57	2.8	11.4	600
7.00	10.267	.48	2.4	9.7	514
8.00	11.733	.43	2.1	8.5	450
9.00	13.200	.38	1.9	7.6	400
10.00	14.667	.34	1.7	6.8	360

For higher velocities move decimal points to right in first two columns, to the left in the other four columns.

GEAR-BOX CRANKING SPEEDS

Camera Speed in Pictures Per Second	Relative Camera Speed	GEAR-BOX RATIO USED			
		1-3	1-4	1-6	1-8
		REQUIRED CRANKING SPEED IN TURNS PER SECOND			
192	8X	....	....	....	3
144	6X	....	....	3	2 1/4
96	4X	....	3	2	1 1/2
72	3X	3	2 1/4	1 1/2	....
48	2X	2	1 1/2	1	....
36	1 1/2X	1 1/2	....	....	....

Based on Normal Camera Speed of 24 Pictures per Second.

DEVELOPER FORMULAS

Formula	Metol or Equivalent	Sodium Sulphite (Anhydrous)	Hydro-chinone	Sodium Carbonate (Anhydrous)	Borax	Potassium Bromide	Time of Dev. Min. at 65° F.
GRAMS PER LITER OF WATER							
FINE GRAIN NEGATIVE DEVELOPERS							
Eastman D 76*	2	100	5	....	2	....	....
Dupont ND 2	2.5	75	3	....	5	....	....
Agfa 17*	1.5	80	3	....	3	.5	....
Agfa 12	8	125	..	5	..	2.5	....
Agfa 15	8	125	..	12	..	1.5	....
M-Q DEVELOPERS FOR QUICK HAND TESTS							
Eastman DK 50*	2.5	30	2.5	10 Kodak	....	.5	....
Eastman D 72*	1	15	4	22.5	....	.6	....
Agfa 40	1.5	18	2.5	15.5	....	1.0	....
Agfa 64	2.5	25	6.5	14	....	1.0	....
Agfa 103*	1.2	20	4	24	....	.4	....

*Available in prepared packages.

Anhydrous Sodium Carbonate contains about 2% water, monohydrated about 15% water. Therefore when using the monohydrated form increase the quantity about 15%.

The above formulas are adjusted to the dilution recommended by the manufacturers.



MODEL CHINA CLIPPER, built by Paramount prop experts, is posed with Louise Campbell and Fred McMurray of "Men with Wings" cast. Picture by H. A. McAlpin, 659, IATSE.



PARAMOUNT STUDIO IDEA for effective presentation of first feature film built around basketball, starring Hank Luisetti. Stanford All-American, may influence change in ball design. Luisetti is shown here with bleached white ball, similar to type used for night football games, which is more easily followed by spectators. Jack Koffman, 659, IATSE, made the shot.



C. B. DE MILLE gets technical advice of Frank Calvin, son of president of Southern Pacific and Union Pacific railroads for new epic of pioneer railroading. Picture by Don English, 659, IATSE.



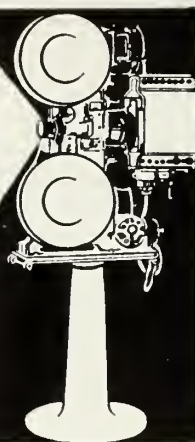
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the handling of the photographic materials. On the average the exposure called for by these numbers is more than twice that actually required for the best possible prints, but decreasing the exposure by that amount is not recommended unless the operator is thoroughly familiar with the characteristics of his exposure meter and of ordinary dark-room practice. The numbers with asterisks represent a safe decrease in exposure under these conditions.

Under adverse lighting conditions passable prints can generally be obtained from negatives given one-eighth the recommended exposure. On the average, however, excellent prints will not be obtained for negative exposures made at a meter rating of more than twice that indicated, which for Spper XX and the Weston Meter would be 160. To make sure that *every* negative receives enough exposure to yield the best possible print, a Weston rating of 80 is recommended.

Of course there must necessarily be a good deal of latitude to any recommendations to take care of individual differences both in equipment and in its use. There are both meter and shutter variations to be considered as well as the use of the meter. The type of developer and the extent of development are also factors. It is highly recommended, therefore, that the advanced amateur conduct a few experiments based on the above suggestions in order to determine the practice most suitable to his own needs.

W. B. Port and Water Sets

The old "Kismet" street at the Warners Burbank lot, which stood for years as a setting for scenes with Near East and Mediterranean locations is being replaced by a new set of the Mediterranean port of Casablanca. The new permanent set will be used first in Warners' Technicolor remake of "The Desert Song."

Warners also are making surveys for a new permanent "water set" on their studio ranch. It will have a 150,000,000 gallon capacity, with a river, canal, waterfall and pumping system.

Staub Directs Autry

Ralph Staub, veteran director, who entered the megaphone ranks after years of experience as a cameraman member of Local 659, IATSE, currently is directing Gene Autry's latest musical western, "Prairie Moon," for Republic. This is Staub's ninth feature for the company.

New Publicity Chairman

Julius Haber, in charge of publicity for RCA Manufacturing Company, last month was appointed chairman of the publicity committee of the Society of Motion Picture Engineers

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PROJECTION

Theatre Sound Optical Systems

Types and principles of sound optical systems for projection equipment described with notes on operations and proper methods of upkeep.

By C. N. Batsel, RCA

(First article in our new series covering modern projection equipment, compiled by C. N. Batsel of the Hollywood staff of RCA deals with the optical systems, including the sound aperture size and position, featured in this company's equipment. There are two accompanying diagrams, one of the sound head in general, the other of the optical system. The picture of the sound head at the Chinese theatre in Hollywood is by Brother Charles Bramel of Local 150, IATSE, Los Angeles. Mr. Batsel's article follows.—ED.)

In this discussion of the projection of sound we will attempt to trace the development of improvements now in use by giving a brief description of the salient features of the parts under discussion as their development progressed. The equipment with which we are dealing is equipment with which we all are familiar, and we will

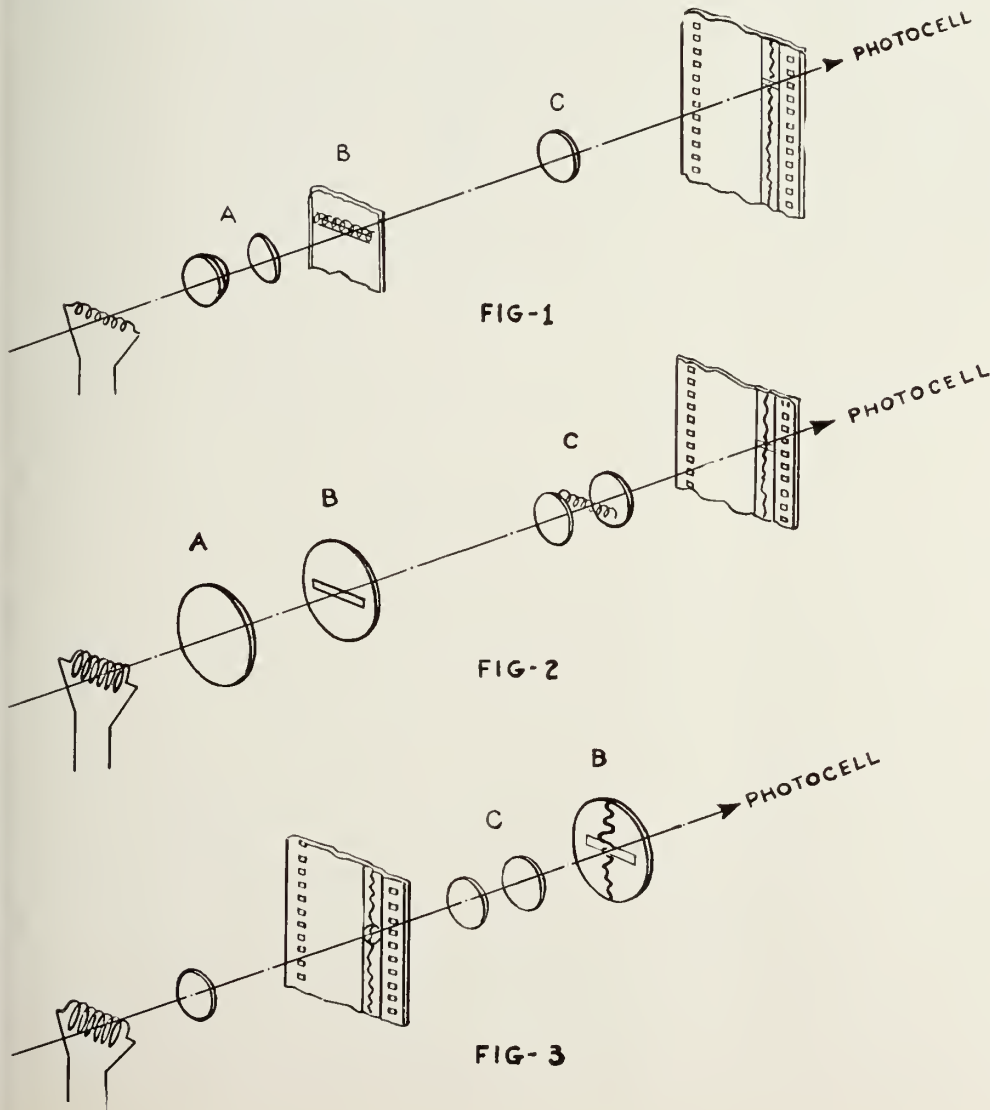
therefore, in this article and the ones to follow deal with it in the order in which we all are accustomed to think of it; that is, the projection room equipment, which consists of the soundhead reproducer attachment and associated amplifier equipment, and the stage equipment, which consists of the speakers and associated networks. It is essential for good sound projection that the projection room equipment do two things: first, scan or take the sound from the track, and second, amplify it and send it to the speakers, which in turn must distribute it throughout the auditorium with sufficient volume for all to hear it with comfort.

First requisite of a good reproducer is its ability to scan or convert the sound track image into an electrical current so that it may be transmitted and amplified. This is done by means of a photocell and an optical system. The function of the photocell is, as we know, to convert the small and rapid fluctuations of light into electric cur-

rent as will be described later, and the function of the optical system is to supply the light in sufficient quantities and in such a shaped spot or ray that the passage of the sound track between the light and photocell will cause it to blink or vary its intensity in proportion to the variation of the recorded sound waves on the film.

Variations in the sound waves on the track are sometimes very fine lines. In order that such a fine line be capable of blocking off the light as it passes, the light beam must be as narrow as the finest recorded sound wave. It must also be as long as the sound track is wide, and last it must be evenly illuminated across its entire length. It is readily seen that if the light is weak at any point across the reproducing beam, the change in the light that strikes the photocell will not be constant all across the sound track.

Earlier sound reproducers obtained this narrow beam of light by cutting a very fine slit in the sound film gate. A piece of quartz was inserted in the slit to prevent it filling with dust and blocking off the light. By strongly illuminating the slit from the rear of the gate sufficient light would shine through the narrow opening to scan the sound track as it was pulled through. This means of obtaining a narrow light beam did not prove very satisfactory as it was hard to keep the quartz securely anchored and the slits were subject to dust troubles in spite of the precaution of inserting the quartz. It also was very inefficient;



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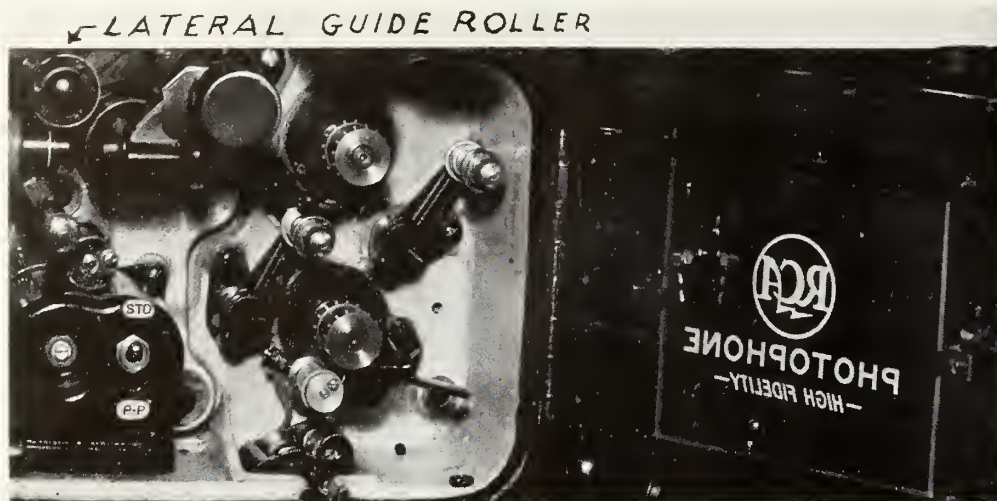


FIGURE 4

The one illustrated in *Figure 1* employs a lamp containing a small round filament that is imaged by the lens System "A" on to the stop or limiting slit "B" which is in turn imaged on to the film by lens "C". This is called an imaged filament type, as the filament image at "B" is re-imaged to the film. The slit "B" being slightly narrower in vertical width than the filament image it presents a straight bright line with smooth edges when imaged on the film. This type of system has only been used in certain type reproducers that employ sound gates and the length of the slit across the sound track is usually restricted to the proper length by a vertical slot that is cut in the gate immediately back of the position occupied by the sound track. This system is fairly efficient but is subject to troubles due to sagging lamp filaments and it also is very critical to vertical lamp adjustment.

Figure 2 illustrates what is known as the imaged slit system, and represents the type of optical system now generally used by reproducer manufacturers. It employs a lamp containing a coiled filament that is imaged by the condenser or collector lens "A" at a point within the smaller lens "C". "B" is an evenly illuminated mechanical slit of the proper dimensions for scanning the sound track according to present SMPE standards.

This type of optical system is very efficient, and while it is subject to some extent to lamp adjustment it is not as critical as other systems. While in general use the optical system is so placed that the slit is imaged directly on the sound track, the system employs itself readily to what is known as the inverted system in which the film instead of having the slit imaged at the sound take-off point is merely brightly illuminated, and the objective lens and slit are between the film and the photocell, as shown in *Figure 3*. The objective lens "C" in this case acts as a projection lens by throwing an enlarged image of the sound track on the slit "B", whose dimensions are calculated so that, considering the magnification factor between the sound track image at "B" and the sound track, it will be completely covered by this image of the smallest sound wave, thus fulfilling that condition in the same way as the other types. The light passing through the slit falls on the photocell and acts the same as the other systems. This type of optics has never been generally used in soundheads but is used in certain types of film phonographs.

The general trend in exciter lamp constructions at present is toward the bayonet base, heavy coil filament type. A lamp of this type is in general very rugged in filament construction and is ideally suited to the imaged slit type optics in which for the sake of light efficiency it is desirable to leave the entire filament imaged into the objective lens as shown in *Figure 2*. There are several styles of

and difficulty was experienced in getting sufficient light through to the photocell, which in those days also was very inefficient compared to our present standards.

Following the quartz-filled slit two general types of optical systems were evolved for reproducers. Filaments in use at present that fall into this general classification but vary somewhat in their size and shape, depending on the design limitations of the power supply. From this point of view it is sometimes better, for the purpose of employing low current capacity rectifiers, to use a small filament low current lamp, such as a 27 volt, 1 amp. lamp. There are some equipments in use which employ A.C. current in the exciter lamps; when this is the case it is desirable to use a lamp such as the 10 volt, 7.5 amp. type which is constructed with a very large wire filament. The use of a lamp of this type under this condition reduces the hum or photocell pickup from the lamp as the large wire will not cool during cycle reversals, and therefore the light intensity remains more nearly constant.

Figure 4 shows a modern projection room installation in Grauman's Chinese Theatre in Hollywood, California. This projection room is equipped, as are thousands more, with RCA rotary stabilizer soundheads which insure uniform speed and proper scanning of the sound tracks, which in turn insure undistorted sound reproduction. *Figure 5* is a self-explanatory drawing showing

the main features of these heads. The imaged slit optical systems used on these heads are assembled and sealed into a small compact oil and dust-proof tube or barrel. The slit is of the proper dimensions to form an image on the film which is eighty-five thousandths of an inch in length and one and one-fourth thousandths of an inch in width. The slit is permanently adjusted at the factory and is located so that it is in perfect horizontal alignment. The lamp employed is a heavy coiled filament type of 10 volt, 5 amp. rating. It is constructed especially for this use and has a bayonet base and pre-located filament. Lateral adjustment is provided for the lamp by means of the screw in the socket base. Additional lateral adjustment can be had if necessary to bring the filament nearer the optical center by rotating the lamp 180°.

Vertical adjustment can be and should be made until, when viewing the light through a thin white paper held directly in front and close to the objective lens, an even spot of light appears to be in the center of the lens.

In reproducing a sound track (as we all know) the slit should be evenly illuminated and, as before stated, it should cover the entire width of the sound track. With an optical system of this type even illumination of the reproducing slit is assured when the evenly illuminated spot of light appears to be centered in the objective lens as seen on the paper as described in the previous paragraph. External adjustment of the slit is in reality not a slit adjustment but is accomplished by an adjustment of the combination pressure and guide roller ("shown in *Figure 5* as "Lateral Guide Roller,") which holds the film in contact with the rotating gate. This roller can be moved in and out the proper amount to place the slit image in the exact position as prescribed by the Standardizations Committee of the SMPE.

It also is necessary, in order to reproduce the higher frequencies, that the optical system be in focus so as to insure a narrow, sharply defined image of the slit in the film. Authorized factory engineers are regularly supplied with the latest tools and track location films which bear the approval of both the Society of Motion Picture Engineers and the Academy of Motion Picture Arts and Sciences. These films are designed so that the service engineer can quickly and efficiently determine the location of the slit image and film position. Following such a diagnosis, corrections and adjustments can be quickly made.

Inasmuch as the function of the optical system is to transmit light and form a good sharp image of the slit it becomes quite obvious that the lens surfaces must be kept clear of oil and dust. A

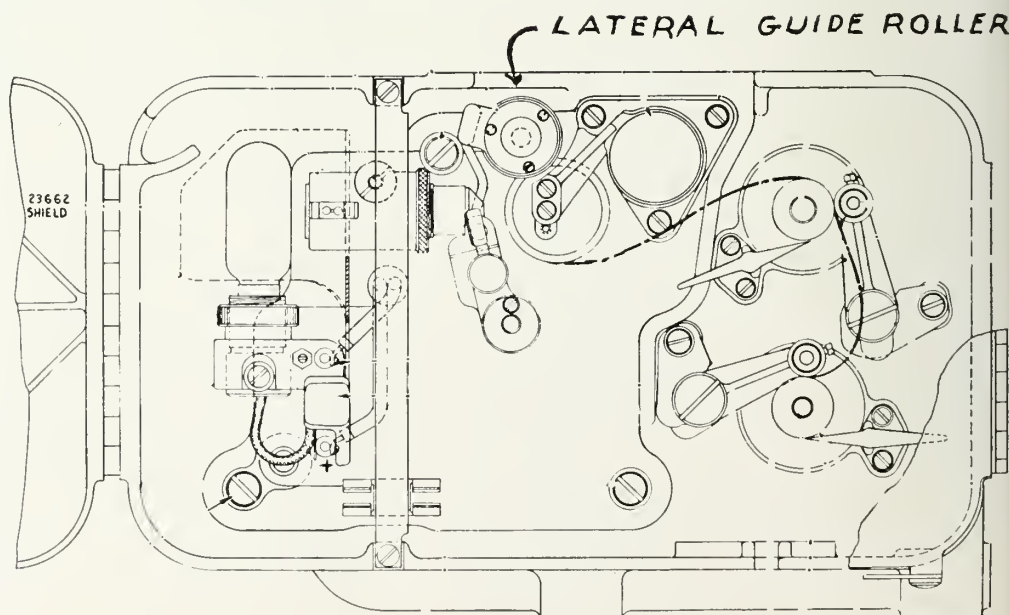


FIGURE 5

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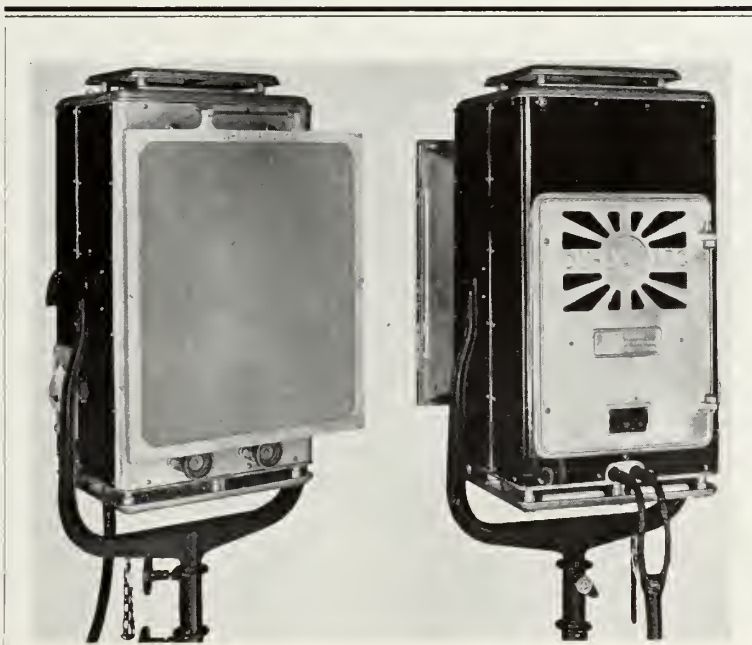
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film of oil or dust on the surface of the lens will scatter some of the light rays as they pass through and prevent them coming to sharp focus. This is particularly true of the objective lens that forms the image of the slit on the film, and this lens should be inspected quite often so as to

ascertain that oil and dust have not collected on its surface. Lens tissue only should be used in cleaning the lenses.

In general it is felt that the adoption of the inherently sealed imaged slit optical system having only two lens surfaces exposed to the air, with

provisions for ease of focusing and track location adjustment that are provided—along with incorporation of the rotary stabilizer which will be described in the next article—have provided a soundhead reproducer which far excels equipment heretofore offered to the trade by RCA.

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TRADEWINDS



At Left, the new Photrix device for handy and certain fastening of photometer to camera. (Page 1, Column 3). At right, the new Tenax camera, Zeiss contribution to miniature sequence photography. (Page 1, Column 1).

PHOTOGRAPHY

Zeiss Tenax and Movikon

ZEISS ANNOUNCES this month a new miniature camera, the Tenax, for all-round photography, but also capable of taking successive pictures at high speed, and also a fine precision 8mm. motion picture camera, the Movikon 8.

The Tenax uses standard 35mm. film in daylight-loading spools or cartridges, making 50 negatives 24x24mm. on a single loading. The standard lens is a Sonnar f/2.4cm., and others are available. All lenses couple with a built-in range finder combined with view finder in one large opening, and focus with a lever under the lens mount.

It has a built-in self-timer and Compur-Rapid shutter with a top speed of 1/400 second, with the shutter release on top. A short-throw lever under the second finger of the right hand advances the film and cocks the shutter with a single movement. Negatives are 1x1 inch, but since the focal length is 4 cm., the image size as compared to a 5 cm. lens on a negative size of 24x36mm. is substantially the same proportion.

The Movikon 8, finished in chromium plate and grey leather, uses either single-8 or double-8

film in standard 24-foot rolls, runs at 8, 16, or 64 frames per second, carries about 11 feet of film on a winding. Interchangeable lenses are in bayonet mounts with the Sonnar f/2.1 cm. as standard. Because of its tremendous depth of focus the 1 cm. lens is in a fixed mount. The Tessar f/2.7-2 cm. may be focussed by scale from 18 inches to infinity. The built-in view finder contains indicators showing how many feet of film the motor will pass before running down and whether or not there is still film in the gate, and also may be used as an angle finder. It has a sliding mask to show the field of the 2 cm. lens. Additional controls permit single exposures for animations, self-timer, and cable release fitting. There is a conventional dial showing the film footage and another spring-tension indicator, both on the outside of the camera. The film gate is readily removable for cleaning and loading is extremely simple.

Zeiss also announces the Bernotar Orienter for the Contax, which enables you to observe the polarizing effect through a coupled viewer as the Bernotar is rotated before the lens. The Orienter attaches to the outside bayonet mount of the Contax and is controlled by a convenient knurled wheel synchronously operating the viewing and taking polarizers. With it the photographer knows that precisely what he sees is what he takes.

Photrix Adapter

THE PHOTRIX ADAPTER which has been developed for the special purpose of fastening the Photrix Exposure Meter to the camera is now available.

The Photrix Adapter fits any camera which is provided with the usual view finder bracket. On other cameras, such brackets can easily be installed in any convenient place. To fasten the exposure meter to the camera, slide the meter into the Adapter and slide the foot of the latter into the bracket. The meter will then be held securely in place, yet it can be detached any moment. The Photrix Meter is especially suited for operation as part of the camera on account of its high sensitivity and its very compact design. It is ready for use at all times and has no discs or levers which need to be set so that it does not interfere in any way with operation of the camera. The Photrix Adapter is distributed by Intercontinental Marketing Corp., New York City.

New Ikonta B.

A NEW MODEL medium priced Ikonta B, a miniature camera taking pictures 2 1/4 x 2 1/4 in size, and now available, ranges in price from \$39.00 to \$66.00. Improved models of existing Zeiss cameras are also ready—the new Super Ikontas with shutter release on the body, a tell-tale signal to prevent accidental double exposures, a slot for an accessory brilliant finder, and the Ikoflex III, an advanced model of the Ikoflex II, which retains the unique condenser-type ground glass with

its brilliant, evenly-illuminated image and built-in magnifier, and adds a wheel focussing control, anti-double-exposure lock, a shutter release on the camera body, and visibility of the diaphragm and shutter settings from above.

Photrix Calculators

TWO CALCULATORS, the one for determining exposure time in enlarging, the other for picture taking, have recently been added to the Photrix line of equipment.

The enlargement calculator is designed to find the required enlarging time after the light emerging from the lens of the enlarger has been measured with the Photrix Photometer or any other light meter which is suited for this purpose.

The calculator in combination with the Photometer represents the first device on the American market which allows determination of the required enlarging time by means of a photocell, without the aid of visual comparison.

Once the emulsion speed of the paper is known, the calculator takes care of the density of the negative as well as of the magnification. The picture size scale extends up to prints of 40x60 inches, which will be found especially valuable in making blow-ups. The exposure time scale goes from 10 minutes down to 0.15 seconds, such fractions of seconds being feasible by means of the Photrix Electronic Timer. The variations in exposure time required to allow for flat or contrasty negatives are taken into consideration by marking lines engraved into the celluloid pointer.

The exposure calculator is to be used to turn any light measuring device into an exposure meter for photography. It is meant in particular for those light meters of high sensitivity which the photographer must resort to where pocket-type exposure meters fail to indicate. In order to allow evaluation of low light readings as obtainable with the Photrix Photometer, the light scale of the calculator goes down to 1/40 of a foot-candle so that exposure readings in a city street at night are now entirely possible. In addition, the calculator will be found valuable in those instances where the exposure time is critical as in color photography. The scales of the calculator are drawn mathematically correct in the style of a slide rule and without sacrificing accuracy for "simplicity of operation."

The Photrix Calculators are executed in etched aluminum with long scales and clear figures, the turntable disc measuring 3 inches in diameter and the base plate 4x4 inches. They fit into the lid of the Photrix Photometer and can be fastened to it by thumb tacks or wood screws.

Miniature Speed Graphic

HAILED AS A remarkable camera engineering achievement a new Miniature $2\frac{1}{4} \times 3\frac{3}{4}$ Speed Graphic was announced last month by the Folmer Graflex Corporation of Rochester, N. Y. Most notable feature is its greatly reduced size—36 per cent smaller than the next larger Speed Graphic camera size. Only $3\frac{1}{2}$ inches deep, $4\frac{7}{8}$ inches wide and $5\frac{1}{2}$ inches high, it is hardly as tall as two packs of cigarettes and much narrower.

The new camera has all advanced features which have made Speed Graphic cameras the standard for versatility and efficiency and has several new ones not at present found in other members of the Speed Graphic line. One of these is built-in focal plane shutter flash synchronization at all focal plane shutter speeds of 1/60 and faster. Another new feature is the provision of dual focusing knobs to make focusing easy and natural for either right-handed or left-handed owners. Helical racks and pinions have been included in its design to afford smooth, frictionless focusing without backlash. Another new feature is its all-metal bed—supplying greater rigidity

and increased protection of camera mechanism and lens when the unit is closed for carrying.

The miniature Speed Graphic's removable lens-board accommodates a wide variety of speed, telephoto and wide-angle lenses, which, combined with the camera's 24 focal plane shutter speeds, gives the owner a picture-taking range sufficient for any occasion. Both an optical finder and folding wire frame finder are provided—the latter facilitating picturing of fast action.

The new Speed Graphic possesses a double extension bellows which enables one-to-one copying and, with short focal length lenses, direct magnification of almost two-to-one. Like all other Speed Graphics, it has a rising and falling front—a feature that becomes invaluable in interior and architectural photography—and ground glass focusing either in the Graphic or Graflex type of back.

Available for the new camera is a special Kalart internally coupled range finder which is synchronized to focus through a range of from four feet to infinity.

These features make the new $2\frac{1}{4} \times 3\frac{3}{4}$ Speed Graphic an ideal camera for all types of picture-taking, night or day. Close-ups, action shots, scenic, pictorial studies, portraits and all-around "snap-shooting" are easily within its range.

Adapter for Kodak Recomar

PERMITTING ADVANTAGES of ground-glass focusing, use of a long-focus lens, and double-extension for "same size" close-ups, a new Miniature-Kodachrome adapter for the Kodak Recomars 18 and 33 is available from Eastman Kodak Company.

The adapter, illustrated on Page 1, consists of a film chamber and ground-glass focusing panel, mounted to slide on a larger panel. The larger panel fits the Recomar back (and backs of some other film-pack cameras) when the regular ground-glass screen or filmpack adapter is removed. A picture is focused on the small ground-glass panel, the film chamber then slid down into position, and the picture snapped.

The film chamber takes No. K828 size Kodachrome, eight exposures to a roll. Transparencies are 24×36 mm. The adapter is fully light-protected, and can be removed from the camera when a roll has been but partly exposed.

Great flexibility is possible with the device—extreme identical-size close-ups of flowers and tiny objects, moderate close-ups, portraits with the improved perspective attainable with a long-focus lens, and telephoto-effect shots of more distant scenes—the last feature being especially notable when the Recomar 33 is used.

The ground-glass focusing facilities photomicrography in color, "table-top" photography, and superior composition in pictorial subjects. Virtually any non-moving indoor or outdoor color subject—except wide-angle views—may be pictured. A tripod is necessary for accurate work.

With each of the adapters is included a table of the effective f-values of the different lens apertures for various lens-to-subject distances; and factors for exposure increase with greater-than-normal extensions are provided in the instruction booklet. For either the Kodak Recomar 18 or 33, the new adapter will retail at \$23.50.

Sun Ray Family Complete

MAKING A FAMILY of ultra-fine enlargers, the Sun Ray Photo Company of New York has built a range of price numbers from \$16.50 to \$57.50, bringing them all well within the budget limit of every possible buyer. The Filmaster, a $2\frac{1}{4} \times 3\frac{3}{4}$ enlarger, sells for \$57.50. The Grant, a miniature enlarger, sells for \$49.50. Then there is the Sun Ray Miniature, an enlarger for \$32.50, and latest the New Craftsman, a $2\frac{1}{4} \times 3\frac{3}{4}$ enlarger, for \$16.50. These precision instruments are

equipped and sold complete with lenses so that the amateur photographer has nothing more to buy.

Though comparatively young in the enlarger field, the Sun Ray Photo Company has many years of photographic equipment manufacturing experience. They also make a complete line of popular priced tripods, lamps, studio lights, spotlights and enlarging easels, both for the amateur and the professional.

New Kalart Speed Flash

ONE OF THE SENSATIONS of the recent Photographer's Convention in Chicago was the first viewing of the new Kalart Wireless Press Speed Flash for Speed Graphic cameras, illustrated on Page 5. Here are some of the revolutionary features:

A built-in mechanical synchronizer, no outside wires, automatic cushioned action, finger tip release from camera bed, weighs only one pound, adjustable reflector for various bulb sizes, quick change socket with a special lamp ejector, multiple lamp connector, remote lighting feature, two positions for reflector, and combination reflector and battery case in one single unit.

As a pioneer in the synchronized photoflash field Kalart has again stepped out to create a product which is just as much a necessity as the Kalart Range Finder which met with such instant acceptance.

During the Chicago Convention a special contest was held by the Kalart Company and all the photographers asked to submit their comments and criticisms. The results were surprising, there was practically a 100 per cent acceptance and praise for the new photoflash outfit. Some of the comments were: "The ejector for hot bulbs is a feature every one used to flash bulbs will appreciate"; "Increased speed of operation and dependability are assured by having only one compact part to detach from camera; elimination of winding or setting; doing away with connecting wires and thus reducing the possibility of shorts or breaks"; "Swell, because it is always synchronized and quick to attach."

A special prize of \$50 was offered for the best comment, with Willard D. Morgan selected as sole judge for making the final selection. This prize went to Willard C. Martin, 681 $\frac{1}{4}$ Wabash Avenue, Terre Haute, Indiana, for the following comment:

"The Kalart Wireless Press Speed Flash answers all the objections I have ever had to speed flash equipment and provides for every contingency I can imagine from a practical photographer's angle. It is as fool-proof and business-like as the other modern materials and equipment with which it is used. This outfit now becomes an integral working part of the camera."

Argus "C" Accessories

ARGUS HAS recently added to its list of 35 low-priced accessories a Macro Attachment, a Copy Lens and a Portrait Attachment for use with their Model "C" Speed Camera. The attachment for Macro-Photography, selling for \$8.75, opens up to Argus Model "C" owners the interesting field of close-up photography. It makes it easy to take detailed photographs of small objects such as flowers, plants, seeds, insects, jewelry, watch-movements, small machine parts, miniature art objects, etc. This attachment also makes possible pictures of bullets, finger-prints, hand-writing and type-writing specimens, useful in police and detective work.

The Argus Model "C" Speed Camera, normally focusing down to three or four feet, which is perfectly satisfactory for ordinary photography, is enabled by use of the Macro-Attachment to focus down to a few inches. This permits photographing of very small objects full-size or slightly reduced on black-and-white or full color

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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VOL. X.

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On the Cover: From Paramount's air epic in Technicolor, "Men with Wings," comes this beautiful shot by Hal McAlpin, Local 659, IATSE, of Ray Milland, Louise Campbell and Fred McMurray. See story on Page 10 about the picture's remarkable safety record.

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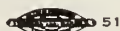
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\$100 for One Picture Big Kalart \$250 Contest

There are 18 cash prizes for Synchro-Sunlight pictures in this contest which closes Nov. 1. Ask your dealer for entry blank and folder on this technique which gives Hollywood studio effects with a pocket light source, the Kalart Micromatic Speed Flash, \$13.50.

Kalart Synchronized Range Finder gives the flexibility of a "minnie" to plate and film pack cameras. It keeps moving objects in focus and costs only \$20.50 installed, for most cameras. See your local dealer or write to your nearest Kalart office.

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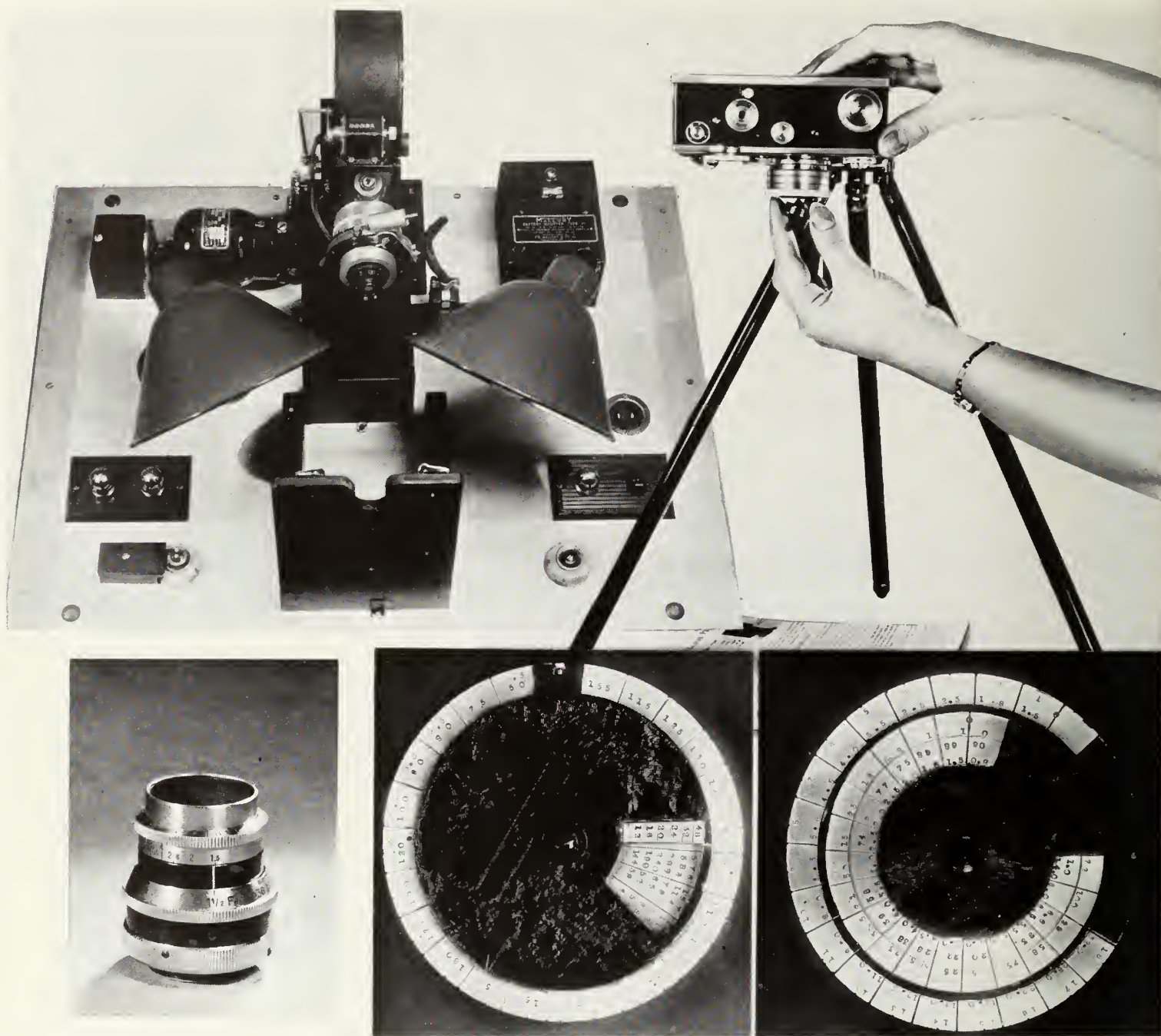
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Top Left, new Micro-Card semi-automatic camera devised by Paul Allen for Academy of Motion Picture Arts and Sciences. (Page 5, Column 3). Top Right, new Argus attachment for close-up shots. (Page 3, Column 3). Lower Right, new f:1.5 Taylor-Hobson Ektol

lens, marketed by Bell & Howell, (Page 4, Column 3). Lower Right, Gene Hagberg's conversion scale for cinematographers (Page 6, Column 1.)

35 mm double-frame negative, and then enlarging several diameters during printing, so the final print shows the object greatly magnified.

Macro photography is made extremely simple by the new Argus attachment. It may be performed easily by the ordinary amateur on the table top at home. The lens barrel is simply unscrewed from the camera body and the Macro extension tube is screwed in its place. The copying-stand collar is then slipped on, and before mounting the legs, the camera lens is screwed to the extension tube. The stage is then slipped onto the legs; a screw in the stand collar is tightened to prevent turning of the camera; and the operator is ready to shoot. By use of two different lengths of extension tubes, separately or in combination, objects may be photographed $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$ size on the film.

The new Portrait Attachment, when used with the Model "C" camera's Cinar lens, focuses from 40 inches down to $20\frac{3}{8}$ inches and covers an area from $18\frac{1}{4}$ inches x $28\frac{3}{4}$ inches down to $8\frac{3}{4}$ inches x $13\frac{1}{4}$ inches.

The new Copy Lens, when used with the Model "C" camera's Cinar lens, focuses from $22\frac{1}{2}$ inches down to $14\frac{7}{8}$ inches and covers an area from 10 inches x 15 inches down to 6 inches x $9\frac{1}{4}$ inches.

New G. E. Projection Lamp

DEVELOPMENT OF A NEW 1000-watt projection lamp that delivers 50 per cent more light on the screen than the present standard lamp of like wattage was announced last month by G-E's incandescent lamp department, Nela Park, Cleveland. Light produced by the new source, according to company engineers, is also appreciably whiter. This dual improvement in quantity and quality of illumination makes possible better screening of 16mm. movies for commercial, educational, and home use. The improvement is attributed to a radical change in the projection lamp's internal construction and to burning the filament at higher temperatures.

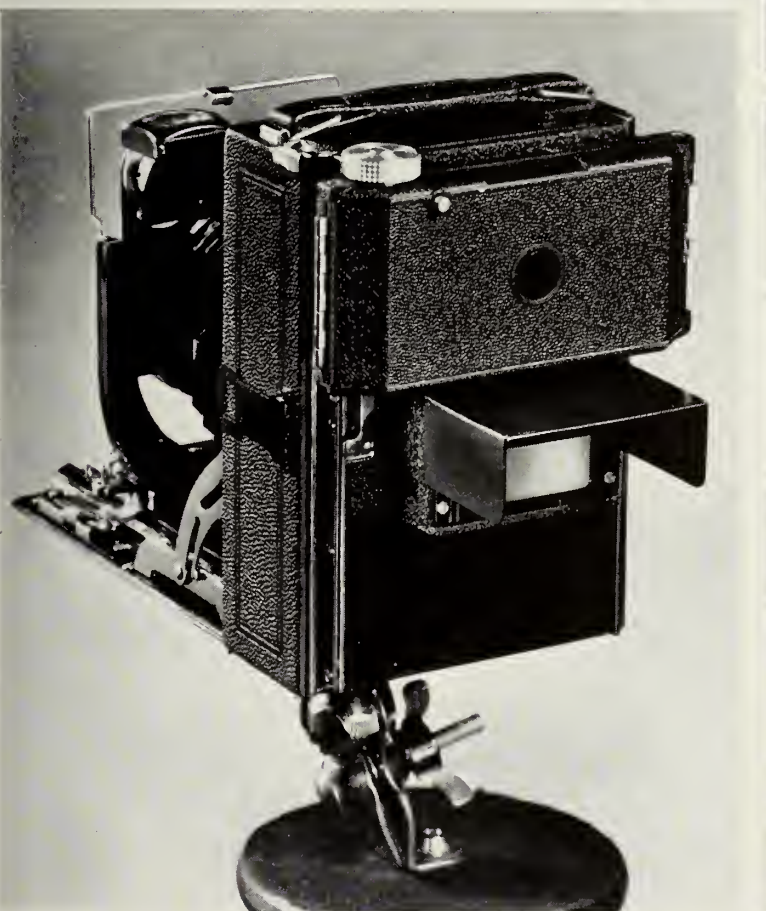
Permitting projection of larger pictures, the new lamp broadens the use of 16mm. projectors. For, it now enables this type of movie equipment to show before larger audiences than has hitherto been possible.

Because of the whiter light the new source also permits more faithful reproduction of colored pictures. Screen illumination is maintained at so high a percentage of initial value that there is no need for inclusion of anti-blackening collector grids in the lamp's internal construction. Construction is such as to secure a high degree of concentration of tungsten deposit at the top of the bulb.

The filament is notably compact, being no larger than the filament of the present 750-watt Mazda projection lamp. The new 1000-watt lamp is designed to burn base down.

New f:1.5 Ektol

SUPPLEMENTING but in no way supplanting the Taylor-Hobson 1" f:1.5 lens recommended and



Top Left, the new Kalart Wireless Press Speed Flash, attached to a Speed Graphic. (Page 2, Column 3). Top Right, the new Miniature Speed Graphic with new special Kalart synchronizer. (Page 2, Column 1). Both these items made big hits at recent Photographers convention in Chicago. Lower Left, the new Kodachrome

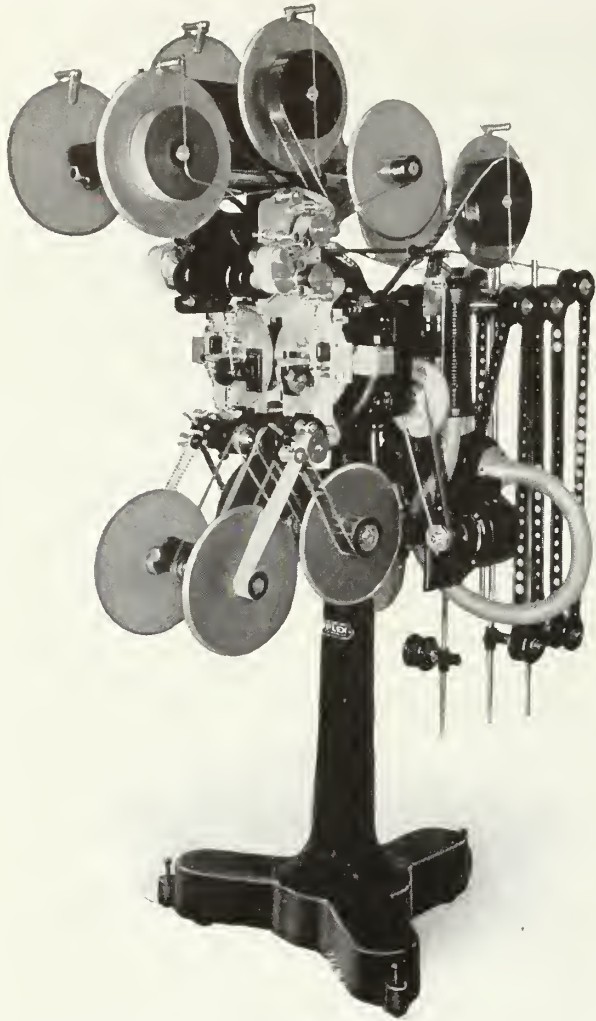
Adapter for Kodak Recomar. (Page 2, Column 2). Lower Right, General Electric's new 1000-watt projection lamp, which is considered an important contribution to 16 mm projection. (Page 4, Column 2).

regularly furnished with their 16mm. equipment, Bell & Howell now offers a somewhat lower-priced 1" f:1.5 lens as optional equipment or for replacement purposes. It is stated that while the new lens is lower in cost, it is of a quality far beyond expectation at the price, since it is fully

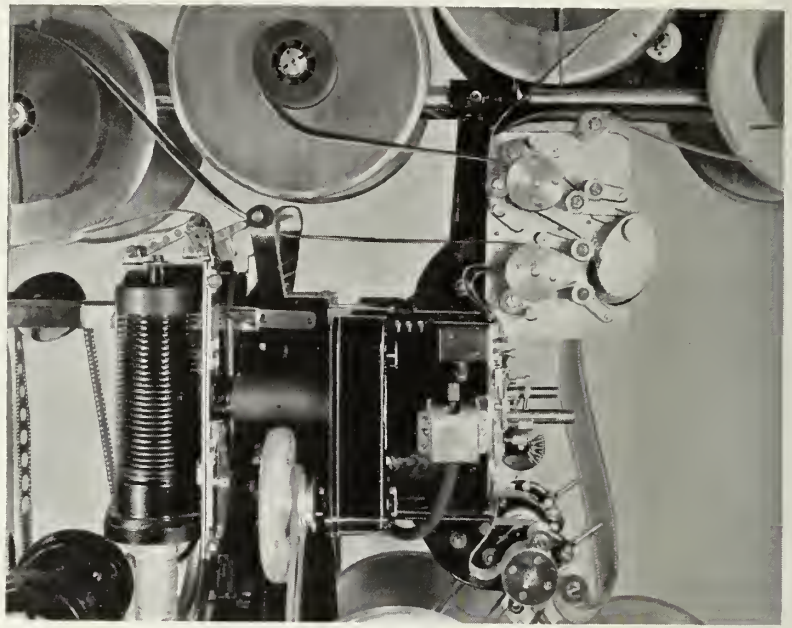
color corrected and accurately calibrated for photographing subjects as close to the camera as one and one-half feet. It is for use on all Bell & Howell 16mm. cameras, and includes adapter when ordered for the Filmo model 121. The list price is \$70.00.

Micro-Card Records

MICRO-CARD DUPLICATION of records, particularly of library, organization card files, etc., in convenient and compact form is made available cheaply through a new method developed at the



At left is a shot of the new Duplex production printer with the dual setup rigged up for color printing. New machine adds many improvements to well-known line. Above is a close shot of the threading arrangement and operating mechanism, which is described on this page.



Academy of Motion Picture Arts and Sciences for their own library and records and now made available, along with the special Micro-Card camera. The camera, devised and perfected by Paul Allen, former member of Local 659, now engaged in photographic research, is illustrated on Page 4. The Academy service includes use of the camera, which is virtually automatic and can be operated by regular clerical help. The actual cards, $1\frac{1}{2} \times 2\frac{3}{8}$ inches, are printed in Los Angeles through special photolithographic equipment. Standard rate is one cent per card. Cards fit 1500 into a regular file tray and four trays fit into a standard 3×5 card file drawer. Text is legible without need of enlarging glass or reading machine. Details of the Micro-Card may be obtained from the Academy, 1201 Taft Building, Hollywood.

Hagberg Conversion Scale

A NEW CONVERSION scale device has been invented and perfected by Gene Owen Hagberg, veteran member of Local 659, IATSE. After much hard work and tedious computation, Hagberg now has the device perfected to the point where negotiations are under way for its marketing. He also is working on a new device for visual analysis of light and a densitometer that may be carried about on the person. News on these additional gadgets will appear in early issues of INTERNATIONAL PHOTOGRAPHER.

The new device consists of three superimposed discs of a light metal or celluloid composition bound together at the axis. The central disc is scaled on one face with degrees of shutter opening and exposure times in fractions of a second. The range of exposure fractions extend from .3456 at 5 degrees to .96 at 180 degrees. This range covers any possible shade or degree of negative density that the cinematographer may desire which is within reach by reason of his camera's widest shutter.

In the original (cardboard working model), the device was scaled to cover any possible shutter opening from 5 degrees to 340 degrees but in order to create an instrument adapted to the cameras now in use here, the present model was constructed on a 180 degree basis. This side of the central disc is the scale devoted to Exposure Time and to facilitate the determination of this factor, a disc slightly smaller in circumference than the center one is placed upon it. This disc has a sector removed through which the figures comprising the exposure times may be seen.

Along one side of the small disc are figures representing the film speed in frames per second ranging from 12 pictures per second to 48 pictures per second. The two discs operating together allow exact control over exposure regardless of camera speed, shutter opening, or necessity of maintaining exposure during rapid speed changes.

In operation the cameraman may rapidly and without errors attributable to custom or guess-work compute his exposure time. If a greater or a lesser degree of exposure is requisite this may also be accurately controlled by merely shifting the sector disc to that fraction of exposure which is deemed to be ideal for the purpose and then

reading off the film speed and the necessary shutter opening. For a more complete coverage of this problem the sector disc may be scaled from one frame per second to one hundred frames it all depends of course upon the uses to which the device will be applied.

FILTER FACTORS, TRANSMISSIONS AND FILTERS. The reverse side of the central disc is cut into 18 sections, each of which constitutes a distinct division of the "F" system from $f:1.5$, to $f:32.0$. There are few lenses in present use that have a wider opening than $f:1.5$ or smaller than $f:32.0$, hence this range is adaptable to all problems dependent upon the lens stop factors for solution. On the outer circumference of this central disc are numerals from 1 to 18, which are intended to be a subtraction scale.

As in the case of the reverse side of this disc, a smaller one is placed upon it. This small disc has three separate scales which are again divided into 18 sections. On the outer circumference are the Filters in common use on production, these ranging from the Aero 1 to the 72. There are 18 Filters in this group. A line divides the Filters from the next scale which constitutes the total light transmission of each of the Filters. On the inner circumference is a scale of so-called Stop Factors. Used together, these three scales will be found an answer to any problem involving the compensation of lens stops for filter factors. In operation the cameraman places the figure of his Filter opposite the "F" stop. He then subtracts the stop factor from the scale found on the scale on the outer circumference of the central disc, which gives him the exposure WITH the filter.

Here combined in one device are ready answers to most problems likely to confront the cameraman during his daily work. As a companion piece to the electronic photometer it is valuable because foot candle power readings are more easily translated into exposure factors.

LABORATORY

Duplex Production Printer

DUPLEX IS READY to announce a new model production printer for color printing, lavenders and dups, featuring new automatic light change, speed, perfect registration and contact, dissolving shutter and the familiar Duplex dependability and expectation of long years of service.

The Duplex production printer is claimed to be an ideal color printing machine, as it is designed so that color negatives will be accurately superimposed on the positive by perfect registration and contact. The printing light is also designed for color as the full actinic value remains in correct proportion to the density of the light. This feature, which is brought about

by the new unlimited scene fully automatic light change, insures clear color prints.

The printer is the first of this design to combine all the desirable features heretofore used. It incorporates the new camera style movements with pilot pins and pressure pad with release for registration and contact.

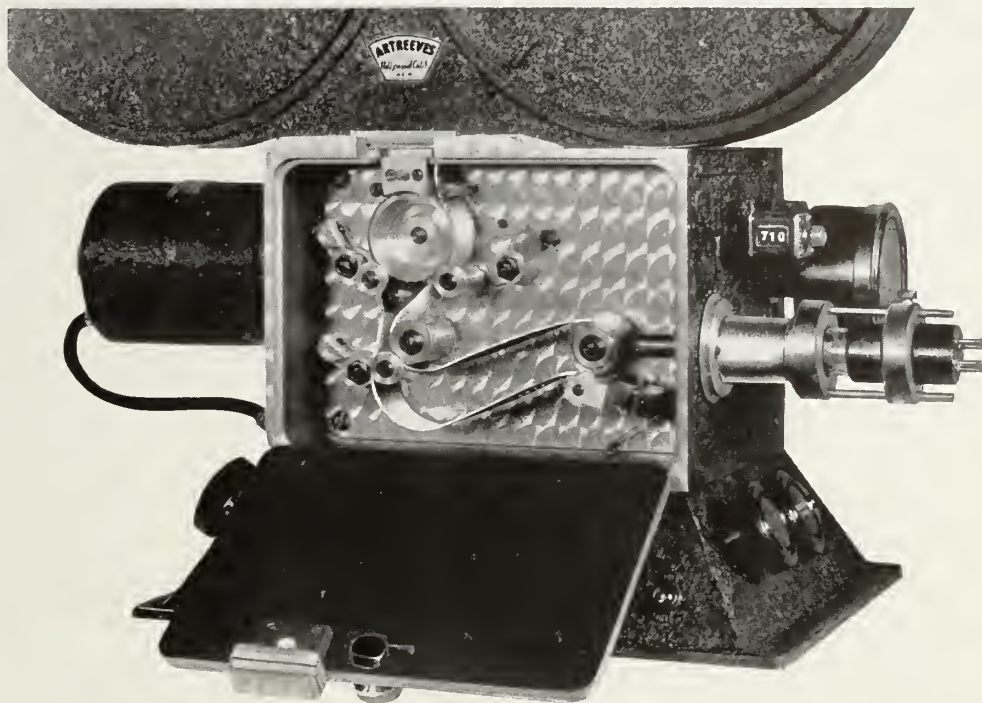
The new printers are available in either the single or double model. The double model is necessary for printing color film. Double pulleys for the silent, non-slip, V-belt drives allow a rapid change in speed for the machines.

The intermittent film feeding mechanism is a precision built camera type movement, constructed for continuous high speed operation. Pilot pins and pressure pad with release insure absolutely rock steady prints at high speeds, while the sound track is printed on a continuous sprocket conveniently located above the gate. The film gate contains the pressure pad, which eliminates wear or possible scratching from the automatic release. The image being visible through the gate while the picture is being printed is an additional advantage in making the machine as fool-proof as possible.

Speeds of the new type printers are 30 and 60 feet per minute for color printing and 60 and 120 feet per minute for black-and-white.

The new printers are delivered ready to operate by plugging in the electric current supply. Air-conditioned lamp houses, smooth friction take-ups of the 1000 foot rolls, and the features cited above contribute to instant rapid operation. Threading is easy and convenient. The equipment carries the usual Duplex 100 per cent one year guarantee.

Although the new light change is entirely auto-



Art Reeves Ultra-fidelity Recorder now available.

matic, it may be operated by hand if desired. It changes the amount of printing light on the frame line and uses about one inch of opaque

film for each scene. The punched opaque film may be filed away with the negative for future reference without inconvenience.



Ultra-Fidelity Recorder

THE NEW MODEL Art Reeves recorder is perhaps the first to offer advantages of ultra-violet light recording to the independent field, and in addition it is believed to be the first commercially available unit in which "black light" has been used for variable-density recording.

The new recorder is of the portable type. Primarily intended for a fixed installation, either as a studio unit or in a sound truck, the equipment is sufficiently compact to be carried on location as a portable recording unit.

Its adaptability is heightened by provision for complete interchangeability of driving motors, permitting normal operation from almost any desired power supply, including batteries, DC or AC generators, or from alternating current mains of almost any frequency.

To gain this flexibility, driving motor is a separate unit, attaching to a conventional, camera-type motor mount. It is therefore possible to drive the recorder with any standard camera motor suited to the current supply available. Normally, battery-powered direct current interlock motors for recorder and camera are supplied with the equipment.

SIMPLE DESIGN. As will be seen from the illustration on this page, the design of the new recorder has been refined to a point of high simplicity. The film is threaded past the main sprocket, over appropriate idling rollers to the recording drum, past the take-up sprocket and the main sprocket, and into the magazine.

All of the sprockets and idling rollers run on ball bearings; the recording drum runs free and is connected to an efficient damper, of a type not affected by temperature changes. The gear trains driving the sprockets are lubricated by a single oiler; the ball bearings require no lubrication, as they are of a special self-lubricating type.

Both manual and automatic speed control are

supplied. The latter is built into the recorder, rather than into the motor, and the wiring arrangement is such that it operates with any type motor. If it is desired for any reason to control the speed manually, the automatic speed control is rendered inoperative by throwing a switch in the base of the machine.

A standard footage counter and tachometer are regularly supplied, built into the recording head on the right-hand end, where both are easily visible to the soundman.

FACILITIES FOR TWO MIKES. The amplifier is substantially the same type already familiar in Reeves recorders. It is contained in a compact carrying case suitable for either fixed or portable use. Facilities are provided for the use of two microphones, which may be of either the latest dynamic types, or of the condenser type, including the Reeves "baby bomb" design. Metal tubes are used throughout, making this amplifier completely non-microphonic.

The ultra-violet recording unit employed is the new Reeves "Line-O-Lite" glow lamp. This is a recent Reeves development, designed for installation in any standard glow-lamp recorder.

Its peak radiation is in virtually the same band of the ultra-violet spectrum as is the peak sensitivity of the newest recording emulsions. The construction of the unit is such that no physical aperture is used in this installation to produce the slit-shaped recording beam.

The light source of this tube is in itself a narrow line of light, simplifying the optical projection which forms the recording beam on the film.

The frequency response of the system is practically flat to 10,000 cycles, with a gradual taper thereafter. The amplifier has a gain of over 125 db.

Bringing the advantages of ultra-violet recording to the independent field, in Art Reeves' opinion, is only a logical step in the continued advancement of this field. "When I entered the business of manufacturing sound equipment," he

points out, "independently manufactured sound equipment was stigmatized as 'bootleg' and was generally regarded as inferior.

"Today the situation is different. To remain in business the independent sound or laboratory equipment manufacturer must have business and engineering policies no less stable and progressive than any major firm. What is more, he must offer truly modern equipment. That my firm, one of the first in the field, has survived and grown has, I am sure, been due to the fact that our products were in every case engineered up to the most modern standards, not built down to a price.

"In the present instance, we have been able to produce an ultra-violet sound recorder for this market while ultra-violet recording is yet the outstanding development in major-studio sound. To do this, our facilities have been expanded and centralized until every component of our recorder is built in our own factory. For those who wish variable-area, the recorder can be equipped with Art Reeves high-fidelity galvanometer.

"Glow-lamps, motors, transformers and many other parts are built completely in this plant, with the result that here, as in any other unit the manufacture of which is thus centralized, the entire equipment can be engineered as a unit, rather than as an assembly of separately planned items."

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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

NEWS OF THE MONTH

PHOTOGRAPHY



WHIZZ went the streamliner as Charles Boyle and his Technicolor camera crew setup close the danger spot to photograph the speeding train for a special color shot. The effective picture of the scene was snapped by Roger Mace.

new products, soon to be marketed, are the first steps in streamlining the Gevaert product. Complete facilities for close technical cooperation with the studio experts along the lines now being carried on by Eastman, DuPont and Agfa, also are set.

Converse and Guerin expect to have the new type emulsions available within the next month, although the recent war scare has interfered with their original plans considerably. General reaction of Hollywood technicians to the new Gevaert plans is that their re-entry into the raw stock field will bring additional healthy competitive spirit to the rivalry of the raw stock organizations in trying to top each other with sensational technical advances.

Technicolor Expands

TECHNICOLOR is expanding its Hollywood facilities at the Cole Avenue plant, with construction getting under way last month. The new setup, it is expected, will double the capacity of the color organization to around 80,000,000 feet a year, to meet demand for the successful three-color process by major producers. The expansion, it is reported, also allows for adaptation to feature production of radical new single film color methods on which Technicolor is working with Eastman Kodak, if and when the research experts and the practical production experts get together on a decision that this process is ready for feature picture use on 35mm stock. Eventually the offices and camera department, now at the Seward Street plant, will be moved to the new spot. The latter plant will be used for experimental and research work and emergency assignments.

Gevaert Revives 35mm Raw Stock

Pioneer Belgian firm enters raw stock technical progress competition with new emulsions as answer to demands of U. S. distributor George Converse and technical aide, Jack Guerin.

AFTER FIVE years of laying low with regard to 35mm professional production, the Gevaert organization, world's first manufacturers of motion picture film, has completed plans to re-enter this field with a bang. Their initial line-up will feature a new fast fine-grain film, with special correction for red and accurate sensitivity to other colors, a new positive and a new duplicating film.

Marketing plans are now being lined up by George Converse, who is the distributor for the United States, with headquarters in

Hollywood. Converse has been working closely with Jack Guerin, who left the International Cinema lab early this year to join the organization, and has recently returned from a five months visit at the Gevaert plant at Antwerp, Belgium.

The American executives have convinced the Belgian chiefs that there is need for radical revisions in emulsion making to meet the demands of Hollywood technicians, if the organization is to take any strong position in 35mm raw stock distribution. The



Will Cline, author of this yarn on the safety record of Paramount's "Men with Wings," is seen Top Center, checking with script girl, Center with William Wellman, who directed, and Bottom, with

camera ship crew. Top and Middle pictures in outside Panels illustrate effective aerial scenes from the film, while the two Bottom Left and Right scenes are described in the story.

"Wings" Great Safety Record

Only one accident in spectacular Technicolor aviation epic at Paramount and none injured; highlights and data on camera work of super safety air job.

By Will Cline, Local 659, IATSE

"Men With Wings," Paramount's Technicolor epic of the air, is being hailed and exploited from every angle by the studio's alert ballyhoo artists, but to the men who were behind the cameras and the rudders under adverse conditions the big thing about this picture is its amazing safety record. There was only one accident during the shooting of air sequences and no one was

hurt in that one.

On this page is a shot of an upturned plane in a field. The plane was flown by Dick Rinaldi and he had to make a forced landing when he ran out of gas returning from a jaunt into the ether. The plane turned over in the plowed field, but Dick escaped without a scratch.

This record is amazing to anybody famil-

iar with the inside of Hollywood's previous air epics, particularly when some of the facts are brought out. First, virtually all the air combat scenes were actually photographed in the air. They're not clever process work. Secondly, although modern radio signaling systems are available, the spectacular scenes in this film were made by pre-arranged signals between the skilled pilots and their squadron leaders. These old ships were of the type flown in the last World War before radio communication was achieved successfully. And remember that all this was photographed with heavy Technicolor cameras.

Much credit should go to William Wellman, who directed the black-and-white epic, "Wings," for Paramount a decade ago, and

now comes through with another corker in color. Wellman was with the Lafayette Escadrille in the World War and his knowledge of both the aviation and photographic problems involved made the work much easier.

And, of course, prime credit must go to those expert steel-nerved men who flew the planes. I am particularly familiar with the work of Frank Clarke, Paul Mantz and Tex Rankin, to whose skill and ability I trusted my life in many a camera ship during the picture.

It is interesting that we made hay while the sun didn't shine in getting some remarkable combat scenes with cloud effects for this film. While Southern California suffered under its worst flood in mid-winter, we got our best stuff during that February flood week. All told, we put in about four months (weather permitting) almost constantly in the air, but we got our best stuff during February and March.

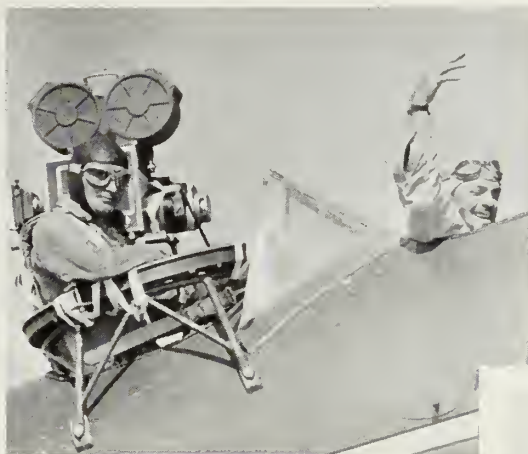
The accompanying illustrations on page 11 show various angles on how we mounted the big color cameras for the air scenes. The new type mounts now in use are light and sturdy, and their swivel design allows photographing straight up or down and a lateral movement in a circle of 180 degrees.

We shot most of our air scenes from 2,000 to 13,000 feet above sea level, and it was plenty cold. The high altitude work demands lots of warm clothes. After donning leather jacket, flying suit, overshoes, fleece-lined gloves and the 20-lb. parachute that is an absolute "must" under present regulations, one feels as though working in a straightjacket and it's no cinch to handle that camera standing up in a 180-mile-per-hour "breeze."

The big difference between black-and-white and color in air work is the startling contrast in ability to follow and distinguish individual planes. The audience will see the color and flash of the spectacular markings against beautiful cloud banks and the blue sky. Don't fail to watch for some of the formations in which the nifty aviators sailed "blind" through cloud banks.

Another spectacular sequence, the start of which is illustrated on page 10, is where Frank Clarke takes off a huge transport plane and the camera ship maneuvers to follow him from his roll down the incline and around up into the air in a sweeping curve.

This was my third crack at shooting color air scenes, the others being Selznick-International's "Nothing Sacred" and Warner's "God's Country and the Woman." It was a relief to get back on the ground for the comparative ease of a regulation Techni-



This array of scenes from Paramount's off-stage shots on "Men with Wings" shows how the big Technicolor cameras were mounted on the camera ships for the photographing of the industry's first spectacular air epic in color.

color production, "Hearts of the North," at Warners.

In conclusion, it was a real pleasure to work with such cooperative stars as Fred McMurray, Louise Campbell, Ray Milland, Andy Devine and Porter Hall; with Duke Greene and his able Local 659 aids who shot the ground production sequences; and with Technicolor technicians Paul Hill, John Hamilton and Andrew Callahan.

Finally, let's not forget those painstaking mechanics, who watched so carefully over the planes, Tod Oviat and Jim Barton. Their super-caution and unceasing minute examinations of the "crates" were greatly responsible for the production's great safety record and undoubtedly saved the lives of all concerned more than once.

SMPE's Fall Meet

Fall convention of engineering body at Detroit, starting Oct. 31; industrials feature.

DETROIT, MICHIGAN, will be the scene of the 23rd Fall, 1938, convention of the Society of Motion Picture Engineers, October 31st to November 2nd, at the Hotel Statler. Meeting in this city for the first time, the engineers of the motion picture industry will view first-hand some of the great progress that has been made in industrial motion pictures.

A comprehensive program of interesting papers and technical presentations is being arranged by J. I. Crabtree, Editorial Vice-President, and Glenn Matthews, Chairman of the Papers Committee. Karl Brenkert, of Detroit, is Chairman of the Local Arrangements Committee.

John Strickler and A. J. Bradford, of Detroit, are assisting W. C. Kunzmann, Convention Vice-President, in arranging details of the convention and the banquet to be held on the evening of November 1st. Mrs. J. F. Strickler will act as hostess to the ladies, assisted by her Ladies Reception Committee.

Notable features of the banquet, to be held at the Hotel Statler on November 1st, will be the annual presentations of the Progress Medal and the Journal Award respectively. The Progress Medal is awarded annually by the board of governors of the Society, in recognition of any invention, research or development which, in their opinion, has resulted in a significant advance in motion picture technology. The Journal Award is similarly made by the board of governors to the author or authors of the most outstanding paper originally published in the Journal of the Society during the preceding calendar year. Names of the awardees will be announced at the banquet November 1st.

Hollywood has been selected as the site of the Spring, 1939, Convention, and New York for the 1919 Fall Convention.

New Agfa Setup

THE CONTRACT of C. King Charney with C. King Charney, Incorporated, distributors of Agfa Motion Picture Films, the expira-

tion date of which was October 15, 1938, has been amicably terminated, it was announced last month. The name of C. King Charney, Incorporated, will be changed to Agfa Raw Film Corporation, and the company will continue its business at its present quarters in Hollywood at 6424 Santa Monica Boulevard.

PHOTOGRAPHY

Studio Clubs Set Joint Program

Series of quarterly exhibitions gets under way with opening bang; International Photographer and IATSE members cooperating in constructive general program.

THE INTER-STUDIO Camera Club, a joint endeavor of film studio camera clubs, got under way successfully last month with its first quarterly exhibition at the Beethoven Society Salon, 4950 Franklin Avenue in Hollywood. The job of bringing together the members of the various clubs in a constructive general program is receiving the cooperation of many veteran IATSE members, particularly in Local 659. Ted Krise is chairman of the joint setup and George M. Haines, members of Local 37, IATSE, and author of the Studio Mechanic's Handbook, which has been appearing in INTERNATIONAL PHOTOGRAPHER, is secretary.

Through the cooperation of the editors of INTERNATIONAL PHOTOGRAPHER important manufacturers of equipment such as Bell & Howell, Mitchell, Agfa, Eastman and Zeiss were represented with interesting exhibits of cameras, films and accessories. Plans now are under way for an outstanding and much larger exhibition shortly before the Christmas holidays.

Sponsors of the Inter-Studio organization are officers of the following clubs: Columbia: Paul Murphy, president; Howard Edgar, secretary; Walt Disney: William Garrit, president; Janet Martin, secretary; Douglas Aircraft: Elmer Wheaton, representative; Paramount: Douglas Rudd, chairman; Virginia Printzlau, secretary; 20th-Fox: Ralph Townsend, president; George M. Haines, secretary; United Artists: Harry Sundby, president; John Wentworth, secretary; Warners: Ted Krise, President; J. L. Edwards, secretary.

More than 540 people attended the initial meeting and as at least 100 were turned away. Plans for the next meeting will determine first on securing larger facilities. In addition to the exhibition of prints, the following program was thoroughly enjoyed:

Piano recital by Betty Jane Look; lecture with slides by Ray Claffin, Eastman Kodak; demonstration of fast light shutter by Elmer Wheaton; two Technicolor shorts, "The

Story of Steel" and Walt Disney's "Donald Duck." All studio clubs mentioned were represented in the exhibition, plus professional prints from 20th-Fox. Among the members of Local 659, IATSE, represented in the latter group, were Gene Kornman, Frank Powolny, Cliff Maupin, Anthony Ugrin, Milt Gold and Jack Woods.

SMPE Nominees

NOMINATIONS FOR OFFICERS of the Society of Motion Picture Engineers for 1939 have been mailed to the voting membership of the Society. The nominees are:

President, E. A. Williford (National Carbon); Executive Vice-President, Major Nathan Levinson (Warner Bros.); Financial Vice-President, A. S. Dickinson (Motion Picture Producers and Distributors of America); Editorial Vice-President, J. I. Crabtree (Eastman Kodak); Convention Vice-President, W. C. Kunzmann (National Carbon); Secretary, J. Frank, Jr. (National Theatre Supply); Treasurer, L. W. Davee (ERPI).

Governors: M. C. Batsel (RCA); G. Friedl, Jr. (International Projector Corp.); A. N. Goldsmith (Consulting Engineer, New York, N. Y.); Homer G. Tasker (Paramount Pictures Corporation).

Two of the nominees for Governors are to be elected. President, Editorial and Convention Vice-Presidents and Governors hold office for two years; Executive Vice-President, Secretary, and Treasurer for one year. The Financial Vice-President is being elected to fill a vacancy of one year.

Officers whose terms expire December 31, 1938, are as follows: S. K. Wolf, President; Homer G. Tasker, Past-President; K. F. Morgan, Executive Vice-President; E. A. Williford, Financial Vice-President; J. I. Crabtree, Editorial Vice-President; W. C. Kunzmann, Convention Vice-President; J. Frank, Jr., Secretary; L. W. Davee, Treasurer; M. C. Batsel, Governor; A. N. Goldsmith, Governor.



Super service furnished visitors to the Islands by Eastman Kodak organization includes the special "camera train," pictured at Left, and an authentic hula presentation with special arrangement for



the photography fan, Right. Both are fully described in the accompanying story by Ira Hoke, veteran Local 659 member, who recently returned from an extended jaunt to Hawaii.

Eastman Service in Hawaii

De luxe attention to photographic needs of travellers pays big dividends to Billy Herman and Bill Sullivan, veteran member of Local 659.

By Ira Hoke, Local 659, IATSE.

NOW THAT THE WINTER season is approaching, when even the beaches of the Southern California coast will be dared by only the hardiest of bathers, our thoughts turn naturally toward our own most lovely chain of eternal summertime islands in the Pacific, Hawaii.

Always we should consider Hawaii as much an integral part of our country as any state in the Union; for while a territory, this series of islands extending for 1,500 miles diagonally across the Pacific is as truly American historically, and as modern as any part of the mainland.

Among this vast archipelago, comprising scores of islands, five stand out in a group known the world over as Hawaii. Reading down your map from northwest to southeast they are: Kauai, Oahu, Molokai, Maui and Hawaii. On Oahu, next to the most northerly island, is built that most beautiful and commercially important city of the Pacific, Honolulu.

This capital city of the islands lies on its lovely harbor, flanked on the east by Diamond Head and on the west by the

Pearl Harbor naval base. Towering behind, not unlike the hills of California's Hollywood, the Koolau Mountains rear green majestic pinnacles.

As the holy men of the ancients dreamed of that fabulous Arabian city, Mecca, so photographers from over the world today dream of the glories of Hawaii. And this is rightly a comparison, for probably nowhere else in the world in an area so comparatively small can one find a diversity of seascapes, mountain fastnesses, cloud-capped pinnacles, beautiful valleys and unscalable precipices.

Unlike those holy men of long ago who dreamed of Mecca, but seldom beheld the wonderful city, thousands of photographers from every land yearly visit Hawaii, and when they at last reluctantly leave, their dreams are fulfilled and their negative boxes overflowing. So let us begin our story as the photographer, amateur or otherwise, will see the "Islands" this winter vacation season.

First comes the entrancing steamer voyage over the most romantic ocean in the

world. Occasionally fortunate passengers glimpse the China Clipper winging its way westward. On calm days that most graceful of all bird fliers, the black albatross, parallels the ship's course for hours on motionless huge wings. Then one dawn the island Molokai rises from the ocean off the port bow and shortly after Makapu Point, easternmost headland of Oahu, breaks through the mist almost dead ahead. Then Diamond Head, like a great emerald in the early sunlight, looms to starboard as the steamer loses headway just outside Honolulu harbor.

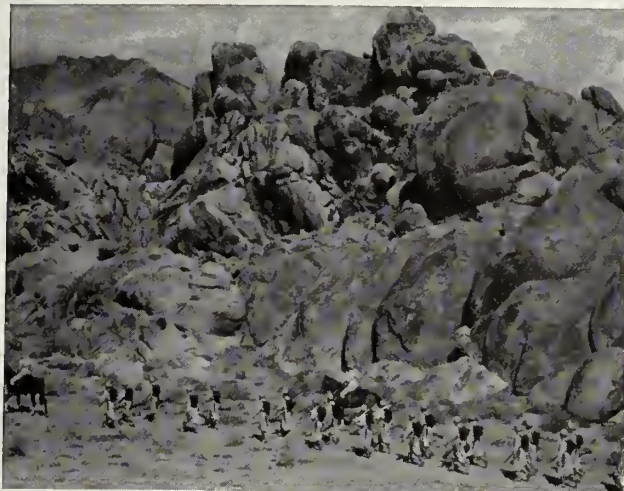
Debarcation is always a gala affair accompanied by enchanting native music of the Royal Hawaiian band and the wholesale greeting of friends and strangers alike with leis of freshly strung flowers. As passengers hurry down the great ramp toward the taxi stands each is courteously presented with a yellow cellophane-covered card on one side of which one reads "Compliments of the Eastman Kodak Stores," while on the reverse side is printed a comprehensive exposure table for Honolulu. This is the photographer's first introduction to that live wire Kodak man of the South Seas, F. B. Herman, known affectionately by all camera fans as "Fritz."

As manager of the Honolulu Eastman Kodak Stores, Fritz Herman has become an institution embodying "service" to all who make photographs throughout the South Pacific. Every visitor to his stores is made

RKO's "GUNGA DIN"

COMBINING action with beautiful photography these highlights from the still set on RKO-Radio's "Gunga Din" are excellent examples of the work of Alex Kahle, veteran member of Local 659. Graphic and virtually self-explanatory, they show off-stage and action scenes from the location trip to Lone Pine, California, at the foot of Mt. Whitney, where most of the exteriors were shot. Stillman Kahle and Camera-man Joe August, Charles Burke, second, and Charles Staumer, assistant, worked under such handicaps as temperatures up to 115 degrees and high winds that more than once endangered the lives of camera crew and technicians atop a 40-foot parallel.





**By Alex
Kahle**

And here is
the stillman
with jitter-
bug elephant
and trusty
camera.



Lighting News

EXTRA

ON THE SET

EVERY DAY

RECORDS FALL TO DUARC

OLD MARKS TOTTER BEFORE NEW CHAMP

Continuing its record-breaking sweep, Duarc, M-R's new twin-arc endurance champion, this week proved its mettle on a major-studio Technicolor set. Working on actual production, Duarc operated a full working day on a single trim of carbons, with no attention or adjustment other than switching off between takes. In more than thirty years that movies have been filmed under arcs, no twin had approached this record.

Previous twin-arc endurance mark, established several years ago by previous M-R twin, had stood at 10 minutes operation between retims. Early last month Duarc shattered this record with a sensational run of 2 hours, 10 minutes 22 4/5 seconds under official timing.

Insiders point to this record as key to speeding up color-film lensing. Ranking high among delays of color production, they say, is time spent retrimming batteries of floor and overhead twin-arcs. Latter especially are often inaccessible. Duarc, able to operate without trimming for half a day or a day speeds production noticeably.

to feel completely at home in Honolulu, to know that an astonishingly complete line of photographic material is always available. Virtually all sizes and emulsions of roll or cut films are to be had in hermetically sealed "tropic pack" cartons at no extra price over the mainland stores. A fine finishing department offers quick dependable service for those who wish to see their efforts on paper immediately.

And there, you may say, is perfect service for the camera fan; but for Fritz such commonplaces were but the beginning of a long series of ever increasing interests in the welfare of visiting photographers. He not only provides the best materials obtainable, but supervises a staff of assistants who are able to show every how, when, where and who in the islands.

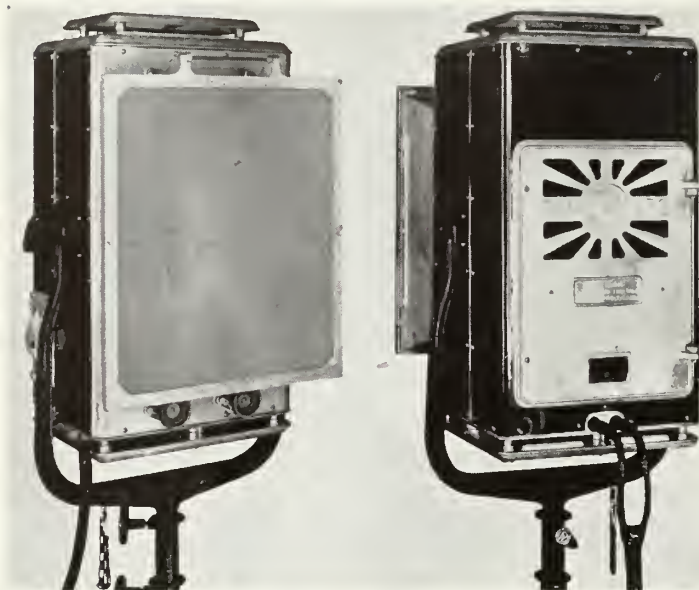
Scenic grandeur of the island of Oahu, while being easily reached over modern paved highways for the most of its area, nevertheless boasts a primitive sector unequalled in rugged coastline beauty inaccessible by automobile. This coastline extends northwest from Waianae around Kaena Point and eastward to Mokuleia. Transportation through this photographic wonderland is possible only over the Oahu Railway and Land Company's tracks, a trip seldom thought of by island visitors as the trains could not possibly stop at all of the beauty spots along the route.

To Fritz Herman it offered an opportunity of service. On Sunday, February 20th last, through special arrangement with the railway company, Herman inaugurated the first "Camera Train" in the South Seas. The holiday excursion, with stops at all the scenic views and plenty of time for a picnic lunch, was advertised in the local papers and from estimates of ticket sales five special cars were arranged for. On Saturday afternoon preceding the trip, ticket sales warranted several additional cars, but on Sunday morning realities exceeded all expectations when it was found that fifteen passenger cars were necessary to accommodate the throng of photographers packed along the station platform, eager to bag picturesque scenes along a route so inaccessible.

Out at the Waikiki store, Manager William Sullivan, well-known in Hollywood as a Local 659 member, has coached novices in camera technique with remarkable results. Last summer he had on display in the Kodak windows one of the most remarkable series of surfboard stills ever made; they were snapped by a native student of Sullivan's.

Many years of professional movie work in Hollywood stand Sullivan in a unique position. The surfboard kingdom of the world lies directly across the street from Kodak at Waikiki, and on favorable days he leaves shop for an hour or so and shoots several hundred feet of Kodachrome 16mm. close-ups of native surfers. These cuts with their definite professional touch may be purchased at a nominal price and cut into any island visitor's memory reel.

Nowhere in all the world does one en-



NEW CHAMPION SILENT

Duarc, the industry's new arc endurance champion (above), remained silent today despite searching quiz by star reporters Mike R. O'Phone and R. E. Corder. Pair at last retired baffled, admitting they were unable to evoke a sound from the brilliant new champion.

DUARCS TO NEW YORK

With Hollywood studios clamoring for services of champion Duarcs, New York's filmsters have joined the demanding parade. As a result, a squad of Duarcs this week entrained for Manhattan, where they will reinforce Charles Ross' battalion of H. I. Arc spots. Side Arcs and Scoops on duty brightening Broadway's Technicolor productions.

DUARC IS PRODUCT OF MOLE- RICHARDSON

Duarc, the sensational new twin-arc endurance champion is the newest product of MOLE-RICHARDSON COMPANY, 941 North Sycamore Avenue, Hollywood, California. Products of the firm, which has affiliates or dealers in London, New York, Paris, Bombay and Cairo, are in use wherever motion pictures are made throughout the world.

DUARC UP FOR "WIZARD"

Several MGM technicians are said to favor Duarc for the role of "Wizard of Oz." One recently pointed out that though Duarc made no claim to increased brightness, he obtained better effects with it at 8 feet than with previous twins at 4 feet. "If that's not wizardly," he says, "I'd like to know what is?"

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picture, superb and dependable photo-

graphic quality. Eastman Kodak Company,

Rochester, N. Y. (J. E. Brulatour, Inc., Dis-

tributors, Fort Lee, Chicago, Hollywood.)

EASTMAN *SUPER X*

PANCHROMATIC NEGATIVE

counter the gorgeous sunset colors found at certain seasons in Hawaii. Of course all the photographic minded folk cannot pick these unusual sunset seasons for their vacation, yet no more fitting close to a 16mm. reel of the South Seas can be imagined. Sullivan long ago realized this shortcoming and began a collection of scenes under ideal conditions available only to a resident cameraman. Cuts of any length are now obtainable at the Waikiki store and few of the 16mm. fans who call there leave for the mainland without a generous footage of his masterful coco-framed sunsets in Kodachrome to top off their reels of island vacation pictures.

Everyone who journeys to Hawaii expects to encounter hula dancers at every turn, but in reality they are almost as rare as movie stars on Hollywood Boulevard. For the amateur photographer to catch snaps or movies of real hula girls was until recently almost impossible. Once again Fritz Herman came to the rescue, and made arrangements for a weekly open air performance especially for photographers, with ideal light and background conditions. This features a troupe of authentic and famous native hula girls in ancient tribal dances. The shows take place on the beautiful lawns of Waikiki natatorium park, on the very ground and with the same wonderful background of coco palms and blue Pacific that once formed the setting for tribal festivities of the early Hawaiians.

Big Negative Strips

Fred Parrish, Local 659, gets sequence action effects without sacrifice of photographic quality.

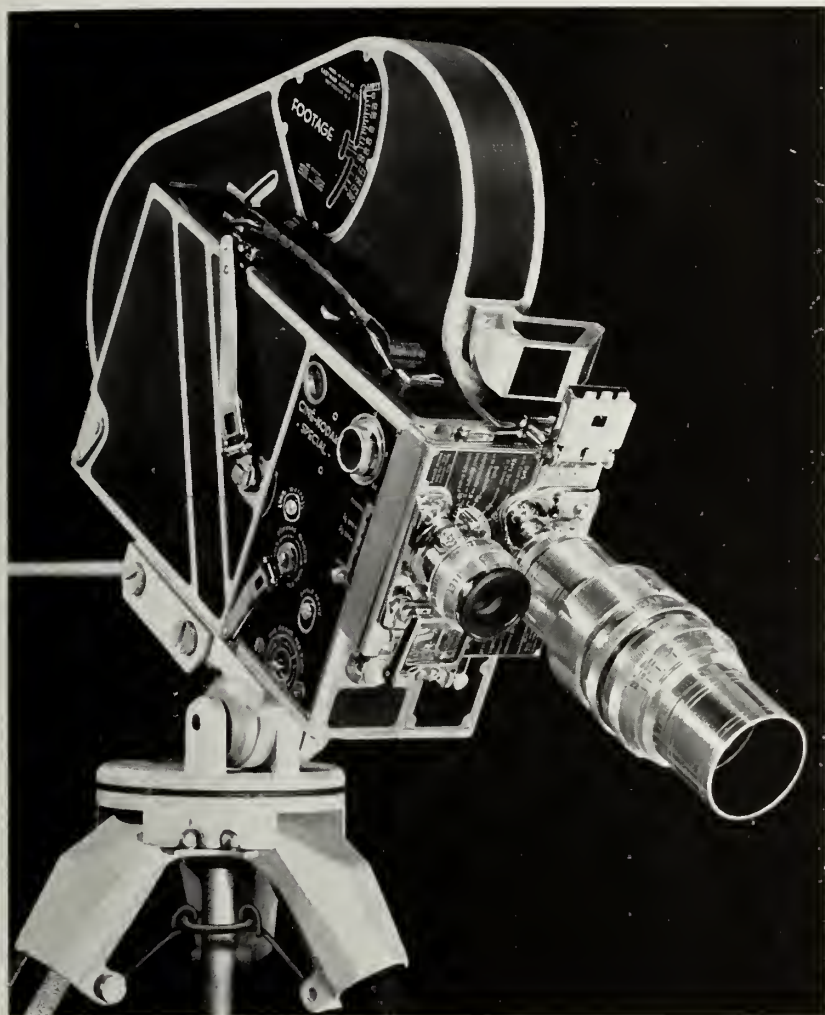
ACTION TO Fred Parrish, veteran stillman member of Local 659, means just that, and Parrish, a former ace news photographer, has a record of getting action in his stills. The news-worthy shots illustrated herewith are typical of Parrish's work, which was particularly outstanding from an exploitation standpoint in his space-getting stills of William Wellman, Carole Lombard and Fredric March for Selznick International's "Nothing Sacred," earlier this year.

Parrish was one of the pioneers of the "magic eye" type of shot for sports and other news coverage assignments in the newspaper field, but he believes that for motion picture exploitation much better photographic effects can be obtained by careful planning, while the cameras with larger negatives than the customary 35 mm of most sequence photography.

Two top pictures on Page 20 are typical examples. They were shot with two 8x10



Two sensational action stills by Fred Parrish, Local 659, IATSE, made for Republic's "Dick Tracy" adventure picture. Top shot of a projection background sequence has whiz-bang action with neat matching of players and projected background.



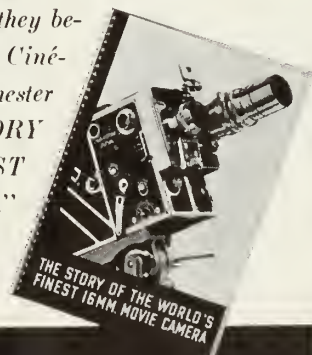
A CAMERA IS NO BETTER THAN THE MOVIES IT MAKES

THE designers of Ciné-Kodak Special have built into one compact machine every refinement necessary to the making of 16 mm. movies—"professional" in scope, strictly "amateur" in ease of attainment. Fades, dissolves, double and multiple exposures, spring motor drive or hand cranking, animation, mask shots, interchangeable lenses for a double-lens turret, ground-glass focusing, interchangeable 100- or 200-foot film chambers, automatic footage indicators, individual film foot meter, single frame counter—these are some of its many unusual features.

Yet, despite the unparalleled versatility of the "Special," so many and so varied are the tasks to which it is put that its users—advanced amateurs, physicists, engineers, doctors, biologists, visual educators, athletic instructors—have frequently requested special apparatus to enable them to go

even further in their work. Most of these devices obviously could not be properly added to the basic model. So they have been designed and offered as accessories: a lens extension tube outfit for almost microscopic magnification; three different electric motors for automatic or remote control exposures; an electric release control outfit, battery operated, for growth studies and other time-lapse filming—to mention but a few in this limited space. And other devices will be made when, and if, necessary.

If this sounds like the camera you need to lift your film efforts to the plane where they belong, ask your dealer about Ciné-Kodak Special, or write Rochester for the full story—"THE STORY OF THE WORLD'S FINEST 16 MM. MOVIE CAMERA."



EASTMAN KODAK COMPANY, ROCHESTER, N. Y.



More action by Fred Parrish, this time from Republic's "Army Girl," which won much favorable critical comment as smartly produced action picture. The two top scenes, though apparently from

a sequence strip were made with 8 x 10 cameras. Parrish used two of them clicking one slightly after the other to get sequence effects with sharp detail on the large negative.

cameras, one right after the other. Parrish believes another way to get sequence effects is to take advantage of rehearsals and re-

takes. Advance study of the script by the stillman will enable the alert photographer to plan a series of shots that will have ex-

cellent photographic quality for reproduction and still get over the sequence idea, no greatly in vogue.

TECHNICAL ARTICLES

MAKEUP

The Art of Make-up Article Two

Second in series of practical and informative articles on modern motion picture studio make-up technique. *By Vernon M. Murdoch, Business Representative, Make-up Artists Local 706, IATSE.*

(With this article on the application of make-up foundations, we resume our series on the art of make-up as practiced under professional motion picture conditions. The author, Vernon M. Murdoch, is the business representative of Make-up Artists Local 706, IATSE, and a veteran and distinguished practitioner of the craft, whose lectures on the subject at Los Angeles arts schools are very highly regarded. Arrangements are now being made by the author and the editors of International Photographer to secure a complete layout of practical illustrations for this series, with the kind cooperation of studio publicity directors and stillmen members of Local 659, IATSE.—Ed.)

IN PICKING UP from the March issue, when we discussed make-up generally, the basic principle of all make-up and the predication of a good or bad make-up is entirely dependent upon the base used, the method of application, and the manner of application. This cannot be too strongly emphasized. In preparing a wood surface you are about to paint you must first prepare the surface to receive that paint. If you do not, then you have a messy, uneven job of painting. The same applies to the application of a make-up foundation, for if you do not evenly cover the surface with the same consistency of material, the same diameter of material equally distributed over the entire face, your make-up will be incomplete, irregular, and in all probability will photograph as dirty looking.

There are many and various make-up base materials in use in the industry today, but all have approximately the same consistency. Therefore, the manner of handling these bases is approximately the same. First, if you are working on the face only, and desire to blend the make-up out at the neckline, use from about one-half to three-fourths inch of base, or, about as much as would cover the thumb nail, and apply in the center of the palm of the left hand. Now take the middle finger of the right hand and with a circular motion work this

base up to the consistency of a thin oil. This will be facilitated by the temperature of the palm of the hand.

Next, place the remaining fingers of the right hand into this material now in the palm of the left and apply it to the face of the subject by touching the face in such a manner as to distribute over the face a series of spots. Having covered the area desired with this base, now with a circular motion of the right hand distribute further from these spots the base applied to the face so as to give an equal consistency both for color and diameter of material over the entire face, the ears, if exposed, under the chin, and on the neck, and blend it out to nothing at the neck line. There is one point in particular which has been omitted in our opening paragraph and that is this: The face of the subject should be cleansed, preferably with soap and water, so as to remove all make-up such as powder bases, eye-shadows, pencils, mascara, both moist and dry rouges. This is very important for, if this is not done, when applying your grease base you come into contact with that portion of the face from which there is the natural secretion, when grease meets grease the grease will miss on these points of secretion and load on the points which are dry, which tends to give you an uneven base.

Having completed this operation, the next step is to cleanse the hands. Take a quantity of witch-hazel in the palm of one hand, rub the hands together, and by a gentle pressing or slapping motion pat the entire surface now covered with the foundation. Now, again cleanse the hands and repeat. The purpose of this operation is firstly to decrease the diameter of the make-up base applied to the face which when the powder is applied will be thinner and permit a freer actuation of the face without giving the effect of, or making the subject conscious of any mask-like effect. Also, it is the same principle as previously expressed in reference to painting. If you use a brush on a wall with a regular stroke you are bound to show in your paint the bristle-marks of

the brush, but if you take a large brush and stipple the surface an even grain and texture is the result. This applies to the handling of the foundation in the same way to produce the same effect.

The foregoing is for the application of grease foundation only. In the event that you are using a water soluble material as a base such as pan-cake make-up, body liquid, or a self-saponifying powder base then the method is as follows: The cleansing of the face as in the first instance here expressed is the same. The next is to take a quantity of the material to be used, first making sure that when it is a wet ingredient that it is thoroughly mixed or shaken up. Put a quantity of this material in a receptacle, use a soft silk sponge which has previously been well-soaked and squeezed dry. Dip this in the material and apply the material to the face with even strokes, being careful that no quantity of the material collects in the natural crevices and orifices of the face.

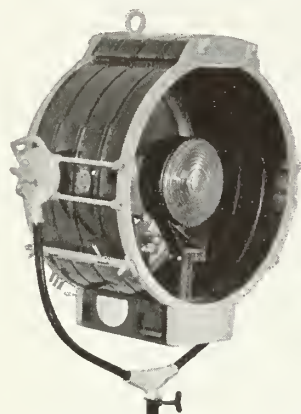
Having done this, now take the hands, which have been cleansed, and with the same circular motion previously mentioned smooth the entire surface. There are many mediums, manners, and methods of doing these aforementioned operations. But in the experience of the writer these have proved to be the most satisfactory and effective. It is in my opinion better to express and explain any method by simple direct terminology and phraseology than by high-sounding technical phrases. Therefore I trust that the foregoing is clear in the manner described. This practically constitutes all that is required in the application of make-up foundations. The next step in completing a make-up will be given in the next issue of INTERNATIONAL PHOTOGRAPHER.

PATENTS

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,121,933—MOTION PICTURE CLAW FEED APPARATUS. William Smith and James Charles Hall, London, and James Bernard Barton, Surrey, England. Application Oct. 19, 1936. In Great Britain Oct. 21, 1935. 5 Claims. (Cl. 88-18.4)

A film advancing device having spring mounted claws to engage the film, a spring to advance the claws and film, and a crank-operated mechanism to disengage the claws and move them back to the first position.



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No. 2,122,890—PROJECTION SCREEN AND ART 'OF PRODUCING IT. *David F. Newman*, assignor to Trans-Lux Corp. Application July 16, 1932. 8 Claims. (Cl. 88-24)

A projection screen comprising a sheet-like translucent body, and a plurality of layers of light-diffusing material associated with said translucent body, one of said layers being a fabric sheet and another of said layers being formed from finely divided material.

No. 2,122,946—FILM FEEDING MECHANISM. *Pedro Lire*, Santiago, Chile. Application Dec. 30, 1935. 4 Claims. (Cl. 88-18)

A film feeder having a reciprocating film carrier, a rocker for producing and transmitting reciprocating motion to the film carrier, and a compressed air operated piston and cylinder means for continuously forcing a contact between the rocker and the film carrier.

No. 2,123,445—FILM DEVELOPING APPARATUS. *John F. Van Leuven*, Los Angeles, Calif. Application Sept. 7, 1937. 15 Claims. (Cl. 271-2.3)

A motion picture film developing device wherein the film passes over a spool so as to force the spool against a drive roller when the film is shortened.

No. 2,123,529—APPARATUS FOR MAKING PROCESS SHOTS IN MOTION PICTURE PHOTOGRAPHY. *Stephen Goosson*, assignor to Columbia Pictures Corp. of Calif., Ltd. Application April 3, 1936. 4 Claims. (Cl. 88-16)

An apparatus for making process shots in motion picture photography; a stage floor; a supporting member pivotally mounted at one end to swing horizontally over the floor; camera, screen and projector units suspended from the supporting member in that order and means for moving said units relative to each other free of the floor; and means for swinging the supporting member.

No. 2,124,106—APPARATUS FOR DEVELOPING FILMS. *Glen M. Dye*, Minneapolis, Minn. Application Dec. 31, 1934. 21 Claims. (Cl. 95-89)

A machine for developing films, having receptacles for holding developer, etc., a conveyor with carriers for immersing the film in one receptacle, raising the film, advancing it, and lowering it into the next receptacle, a device for imparting a series of vertical reciprocating movements to the film while it is in the receptacle, and a series of light baffles to prevent fogging of the film.

No. 2,124,139—APPARATUS FOR PROJECTING LENTICULAR FILM. *John Eggert and Gerd Heymer*, Germany, assignors to I. G. Farbenindustrie Aktiengesellschaft, Farnkfort-on-the-main, Germany. Application Nov. 3, 1934. In Germany Nov. 8, 1933. 4 Claims. (Cl. 88-16.4)

Apparatus for projecting motion pictures in natural colors comprising a source of light, a cylindrically lenticulated film bearing color records the lenticular side of which film faces the light source, said film being positioned in an apertured film gate, a prism grating movable in the vicinity of and in a plane parallel to the film gate aperture and composed of a plurality of prisms which are wider than the lenticulations of the film, the individual prisms being radially arranged as a ring about the periphery of a disc, the axis of rotation of the ring being parallel to the central axis of the film gate, said grating being movably supported between the light source and the film in a plane parallel to the film with the prism spectrum including the range of colors from the extreme blue to the extreme red imaged by each lenticulation in register with the color filter records back of the lenticulation and with the long axis of one of the prisms of said grating which fall directly between the light source and the central axis of the film gate parallel to the film lenticulations, and means for rapidly moving the prism grating in said plane so that said prisms move in a direction substantially transversely to the film lenticula-

tions at a rate sufficient to render invisible dark striae produced by the edges of the prisms.

No. 2,124,297 — POLARIZATION DEVICE FOR CAMERAS. *Carl Herrman*, Jena, Germany, assignor to the firm of Carl Zeiss, Germany. Application May 12, 1937. In Germany May 30, 1936. 2 Claims. (Cl. 95-64)

A light polarization device for cameras which is hinged to permit of its being placed or removed from in front of the lens, and may be rotated in order to transmit the various planes of the incident light.

No. 2,124,322—FILM PULL-DOWN MECHANISM. *Albert W. Tondreau*, assignor to Warner Bros. Pictures, Inc. Application Nov. 22, 1935. 13 Claims. (Cl. 88-18.4)

A film pull-down mechanism comprising the combination of a film advancing member, a rocking slide bearing for said member, an eccentric, a drive shaft for said eccentric, a connecting member slidably connected to said bearing and pivotally connected to said eccentric, means for imparting an oscillating motion to said film advancing member under control of said connecting member, a second connecting member pivotally connected to said eccentric, a cam, an operative connection between said second connecting member and said cam, a cam follower for said cam and an operative connection between said cam follower and said film engaging member for imparting a film engaging and disengaging motion to said film advancing member.

No. 2,124,371—METHODS OF PRODUCING PHOTOGRAPHIC IMAGE CARRIERS PROVIDED WITH PRECIPITANTS FOR COLORING DYES. *Richard Gschopf* and *Karl Pokorny*, Austria; said Pokorny assignor to said Gschopf. Original application Jan. 10, 1934. In Austria July 22, 1933. 2 Claims. (Cl. 101-149)

A method of producing a carrier for imbibition dye prints in which the gelatine layer is provided with precipitants for the dyestuffs, consisting in introducing ammonia into a solution of gelatine, adding a dye mordant in the form of a complex acid thereto, adding acetic acid in amount sufficient to react with the ammonia to form ammonium acetate, and utilizing the resultant solution for making a carrier film.

No. 2,124,587—MOTION PICTURE PROJECTOR. *William J. Morrissey*, N. Y. Application Nov. 26, 1934. 2 Claims. (Cl. 88-16.2)

In a motion picture device, a motion picture film strip, a frame, a film gate, a sound gate spaced apart from said film gate, a series of free rollers for guiding the film to and from said sound gate, some of which are positioned between said gates, said series of free rollers being provided for carrying the film strip with a minimum of sprocket tooth ripple, an arm pivoted on said frame, an engaging roller carried by said arm and normally positioned in engagement with one of said free rollers positioned between said gates, a stud carried by said arm and spaced apart from said engaging roller whereby when said arm is turned to disengage the latter from said last free roller for threading the device, said stud and said free roller define a predetermined length of film between said film gate and said sound gate adapted to form a loop when the arm is turned to re-engage said engaging roller with said last free roller, and a sprocket spaced apart from said series of free rollers for pulling said film strip along a path formed by said free rollers.

No. 2,124,938—TAKE-UP AND REWIND ASSEMBLY FOR MOTION PICTURE PROJECTORS. *Otto Wittel*, assignor to Eastman Kodak Co.. Application Dec. 17, 1936. 12 Claims. (Cl. 242-55)

In a motion picture projector the combination with a support, a supply reel mounted thereon, a take-up arm pivotally mounted on the support, a spindle journaled thereon, a take-up reel on said spindle, frictional driving means for said spindle, said driving means normally supporting the take-up arm and its associated parts whereby

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the frictional engagement varies with the weight of film on the take-up reel, a rewind mechanism for driving the supply reel, a control lever for starting and stopping said rewind mechanism, of a means connecting the take-up arm and the control lever whereby the arm may be raised upon movement of the lever, the arm is prevented from flying upwardly during rewinding, and the arm is supported thereby upon failure of the frictional driving means to act as a support, said means comprising a bracket having one end connected to the control lever through a pin and slot connection, the other end of said bracket being pivoted to the take-up arm.

No. 2,125,015—MULTICOLOR PHOTOGRAPHIC MATERIAL AND A PROCESS FOR USING THE SAME. *Bela Gaspar*, Brussels, Belgium. Application April 2, 1936. In Germany Oct. 26, 1932. 15 Claims. (Cl. 95-2)

The method of producing multi-color moving picture films in a predyed multi-layer light sensitive silver halide material, having at least three layers differently colored by dyestuffs of the shades necessary to form a multi-color image and each being predominantly sensitized for a spectral range such that each of the part images of said multi-colored image may be independently printed into said multi-layer light sensitive silver halide material, and a light sensitive supplementary layer having a sensitivity range different from that of the immediately juxtaposed light sensitive layer and being dyed with a dyestuff which absorbs sufficient light rays throughout the visible spectrum to give a substantially grey to block appearance, which comprise printing the multi-color part pictures into said material, printing another image into said supplementary layer, developing and fixing the latent silver images and selectively destroying the dyestuffs in proportion to the silver deposit.

No. 2,127,829—METHOD OF PRODUCING COLOR EFFECTS IN PHOTOGRAPHY. *Willis H. O'Brien*, Los Angeles, Calif. Application April 28, 1936. 2 Claims. (Cl. 88-16.4)

The method of producing colored photographic effects in motion pictures, which consists in photographing with a color camera a scene having portions of said scene lighted with a predetermined light intensity to cause said color camera to register said portions of said scene, preventing said color camera from registering other portions of said scene, photographing another scene, adding portions of said other scene to the color film produced by said color camera by projecting said second scene upon a screen, coloring said image projected onto said screen or selected portions thereof with desired color values, and re-exposing said color film in a color camera to photograph said projected and colored image on said screen upon the unexposed portions of said color film.

Editorial Note

The accompanying article on projection practice and equipment by C. N. Batsel, of RCA, is part of the symposium lined up by Paul R. Cramer, member of Local 150, IATSE, and contributing editor on Projection news. The editors of International Photographer regret that lack of space has caused us to withhold until succeeding issues, not only Mr. Cramer's own notes on projection news, but also a number of interesting news stories in other departments as well as our regular Books of Tables in various technical fields.

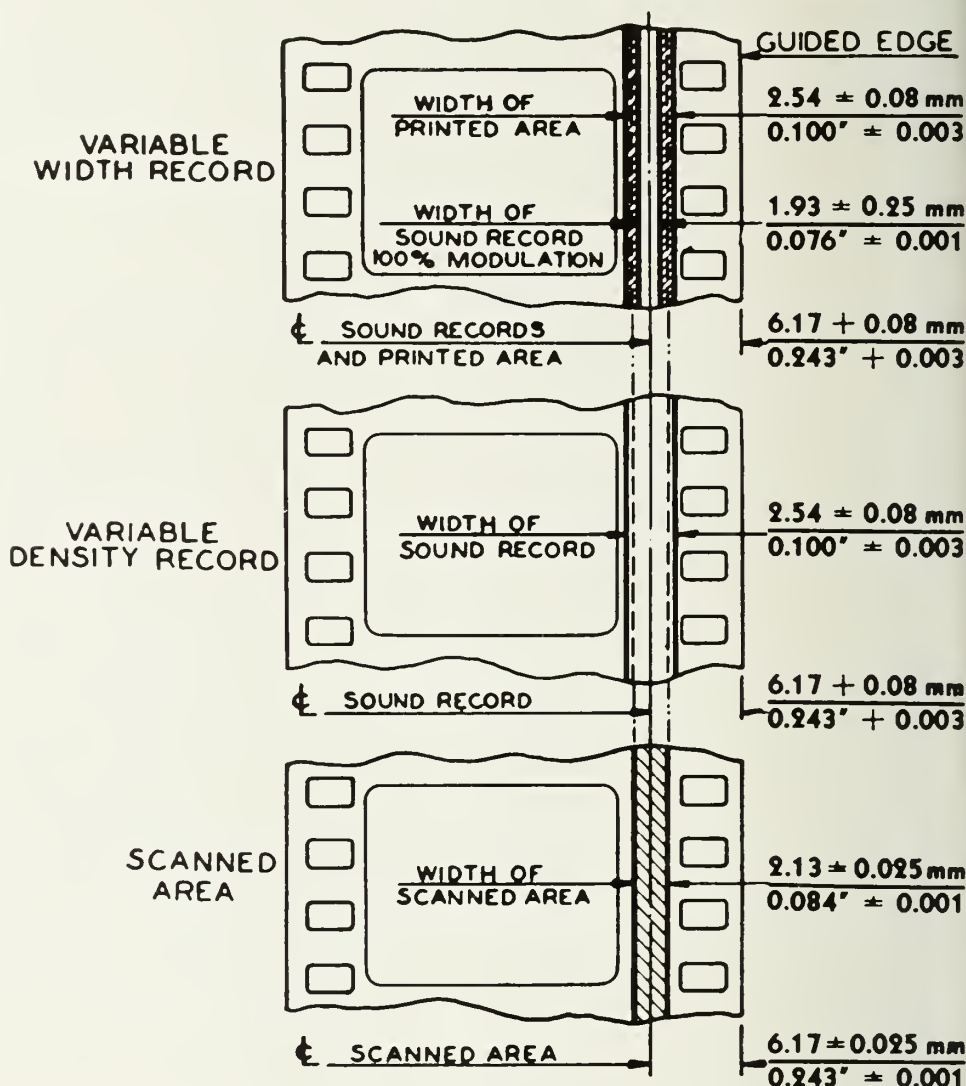
PROJECTION

Mar., 1938]

REVISION OF SMPE STANDARDS

267

ASA 722.7 (Proposal)	AMERICAN STANDARD For 35 mm Sound Film	SMPE DS35-7-1
	SOUND RECORDS AND SCANNED AREA	Adopted Original: 1930 This revision: 1936



When the push-pull type of sound record is used, the minimum separation between the two halves of the sound record shall be 0.152 mm. (0.006 inch). When the squeeze-track is used with the variable-density record, the width of the sound record shall be 1.93 mm. (0.076 inch).

These dimensions and locations are shown relative to unshrunk raw stock.

FIG. 1

By C. N. Batsel, RCA

POSITION OF TRACK. We mentioned in last month's article, in which optical systems were discussed, that the scanning beam of the optical

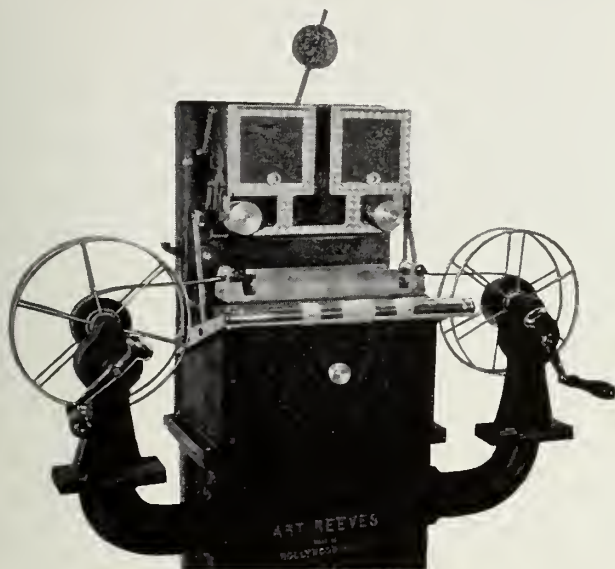
system should be located with reference to film in such a way that the entire sound track would always be covered, and that authorized factory

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engineers were in possession of approved films for locating the scanning light beam in the proper place. The test films referred to are made according to the standards set up by the Society of Motion Picture Engineers and are also approved by the Academy of Motion Picture Arts and Sciences. They are designed to locate the beam of light in accordance with Fig. 1, which is a reprint from the *Journal of the S.M.P.E.*, Vol. XXX, No. 3, 1938. It shows that a scanning beam should be 84 thousandths of an inch in length, so that it will cover an area beginning 12 thousandths of an inch from the film sprocket holes and extending to within 25 thousandths of an inch of the picture area. The width of the area scanned being 84 thousandths of an inch, it is eight thousandths of an inch wider than the actual width of the approved sound track, which should be 76 thousandths of an inch and is located so that the center line of the track coincides exactly with the center line of the scanning light beam.

WIDTH OF TRACK. Sound track printers were designed so that they print or expose an area 100 thousandths of an inch wide that extends from a distance four thousandths of an inch from the sprocket holes to within 17 thousandths of the picture area. The extra width of the printed area is provided to insure that at no time will the scanning beam overhang the edge of the printed area, thus reproducing edge noise. It also provides limited tolerance for weave in the printing operation and in the soundhead.

The reproducer scanning beam being eight thousandths wider than the 76 thousandths sound track provides tolerance in reproduction for weave in the recorders, printers, and in the reproducer itself, up to this amount. Track positions that are off more than that amount will, of course, not be properly scanned.

WEAVE OF FILM. In the design of reproducing equipment provision has always been made

for guiding the film past the scanning point. This is usually done by placing flanged guiding rollers in close proximity to the scanning light beam. These flanged rollers sometimes employ a fixed flange on the edge next to the sound track and a spring pressed flange on the other edge. This type construction permits the film to be continually pressed against the fixed flange. This generally insures that the sound track will pass the scanning light with a minimum of displacement.

The earlier design of reproducers employed a straight or curved friction sound gate as illustrated in Fig. 2, with a spring shoe that pressed on the film, keeping it in contact with the gate surface and consequently in the focal plane of the scanning light. The flanged guiding roller was usually placed at the top of the gate with the pull sprocket, which was usually coupled to

the driving mechanism through a mechanical filter, either directly below the gate or placed in such a position that the film would pass over filter rollers between the sprocket and the gate.

Gate type reproducers are difficult to maintain and they are subject to the following troubles:

Worn spring shoe, which will result in the track running through in a misplaced position;

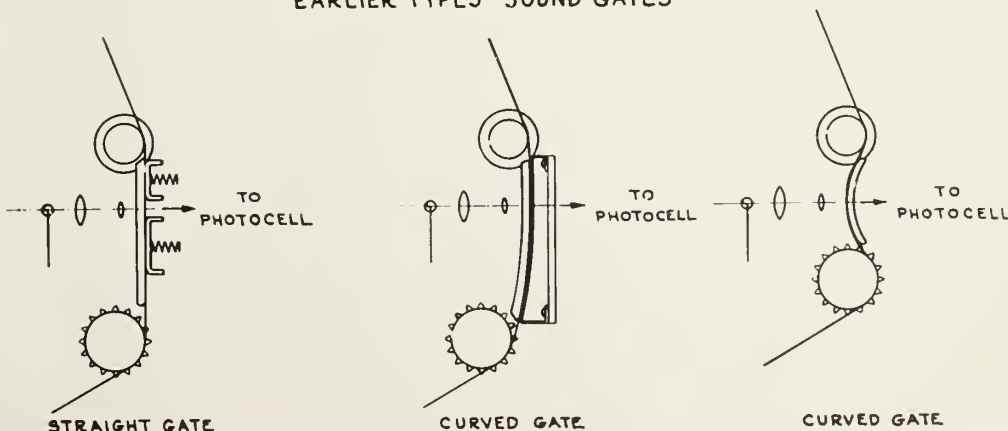
Spring tension on the shoe, if not properly adjusted, will introduce chatter, flutter, and sprocket hole rasp;

Lubrication wax, oil and dirt will collect on the shoes and gate causing chatter and flutter;

Worn pull sprockets will introduce sprocket hole flutter and rasp.

A great amount of research and design work has been done by the manufacturers to produce a soundhead reproducer which would be free

FIG-2
EARLIER TYPES SOUND GATES



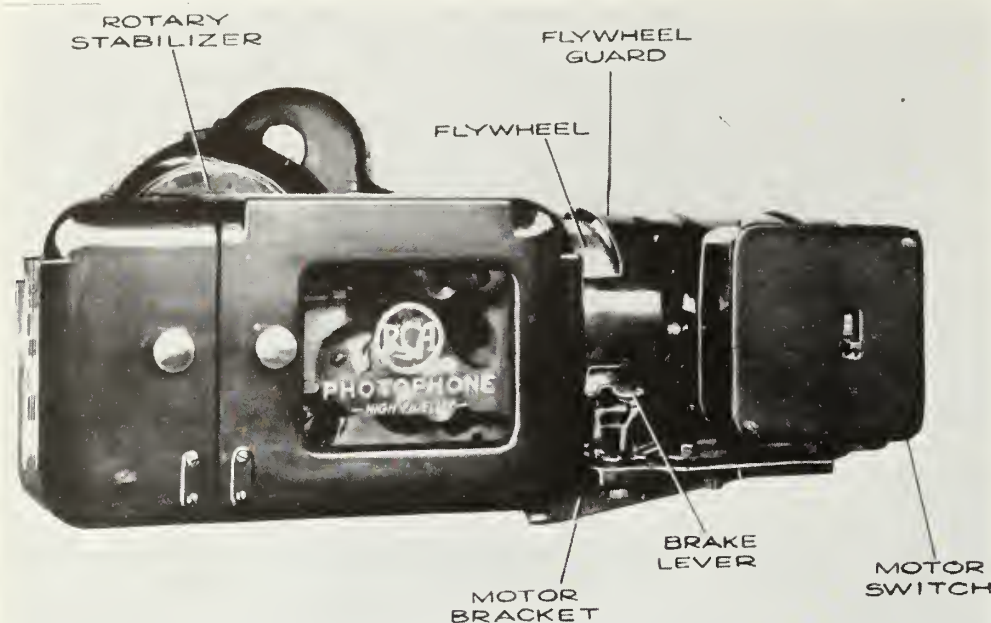


FIG. 3

from gate and sprocket troubles and be capable of delivering sound to the amplifiers with good fidelity without introducing speed changes and unwanted noises and disturbances.

The result of this effort is the modern rotary stabilizer and soundhead illustrated by Fig. 3, which is a photograph of a MI-1050 RCA stabilizer soundhead. The features of this soundhead that make such sound reproduction possible are the rotating sound drum, the rotary stabilizer, and an optical system that employs an imaged slit on the film at the point of sound take off. The feature that insures freedom from vibration noises, such as microphonic lamps and photocells, is the special cushioned free-floating mounting of the entire sound reproducing mechanism.

Constant location of the film as it passes the scanning light beam is obtained by the combination pressure and guide roller which holds the film in contact with the rotating drum at a point just above the sound take off. This roller, shown in detail in Fig. 4, is mounted on ball bearings so as not to introduce a back-drag or load on the film between the rotating gate and the pull sprocket. This roller has an adjusting nut so that it can be moved laterally, and if found out of position it should be located and locked into the proper position by an authorized factory engineer with the aid of the track locating film previously mentioned.

FLUTTER. The rotating gate and rotary stabilizer combination, film path, and optical system employed in these soundheads are shown in their relative positions in Fig. 5. The principle upon which the mechanism operates to insure constant speed is the drum, which is mounted on the shaft whose other end carries the rotating stabilizer and is turned by the film as it is pulled forward by the pulling sprocket. This shaft is mounted in selected ball bearings and turns so lightly that only approximately two ounce inches of torque is required to drive it at full speed. This light driving torque together with the soft loop of film formed by the film between the drum and the pulling sprocket prevents all ripple from the sprocket teeth getting back to the sound take off point. The rotating stabilizer is shown in Fig. 6 and consists of a magnesium, oil tight, hollow shell which is mounted exactly like a flywheel and fastened to the shaft. Being light in weight, this shell is easy to start from standstill and does not impose a hard pull on the film that so often damages sprocket holes when

the machine is started. On the inside of this shell and mounted on a ball bearing concentric with the shaft is a wheel. This ball bearing mounting allows the wheel to rotate independently of the outside shell. The shell is filled with a specially selected oil of the proper viscosity to provide a "coupling" between the wheel and shell sufficient to bring the wheel up to speed with the outer shell when the machine is running. This "coupling" also enables the wheel to keep the shell and drum rotating at constant speed if the sprocket should momentarily slow down and cease pulling on the film. This type of construction is a "damped" device as it will not hunt or oscillate, since any tendency for the shell and drum to change its speed is immediately resisted by the pull of the free-running wheel through the oil coupling between it and the outer shell.

The pull sprocket which propels the film forward and rotates the stabilizer is driven through specially cut gears which insure its having constant speed. It is protected from take-up disturbances by the holdback sprocket which is located at the lower right hand corner of the soundhead.

The entire sound reproducing mechanism, including the optical system, stabilizer, photocell and photocell transformer, is mounted on cushioned shock-proof mounting. This type construction prevents jars and mechanical vibrations from getting to these parts and introducing micro

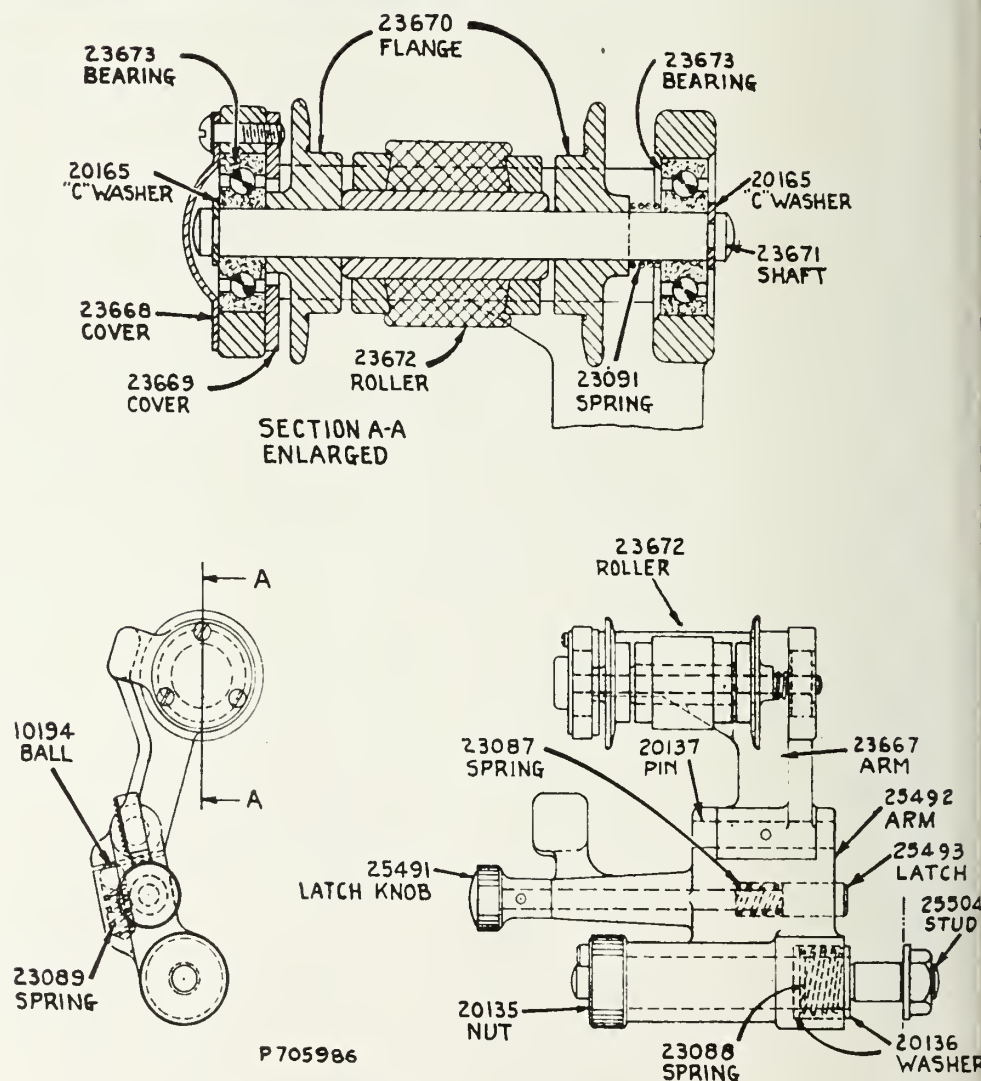


FIG. 4

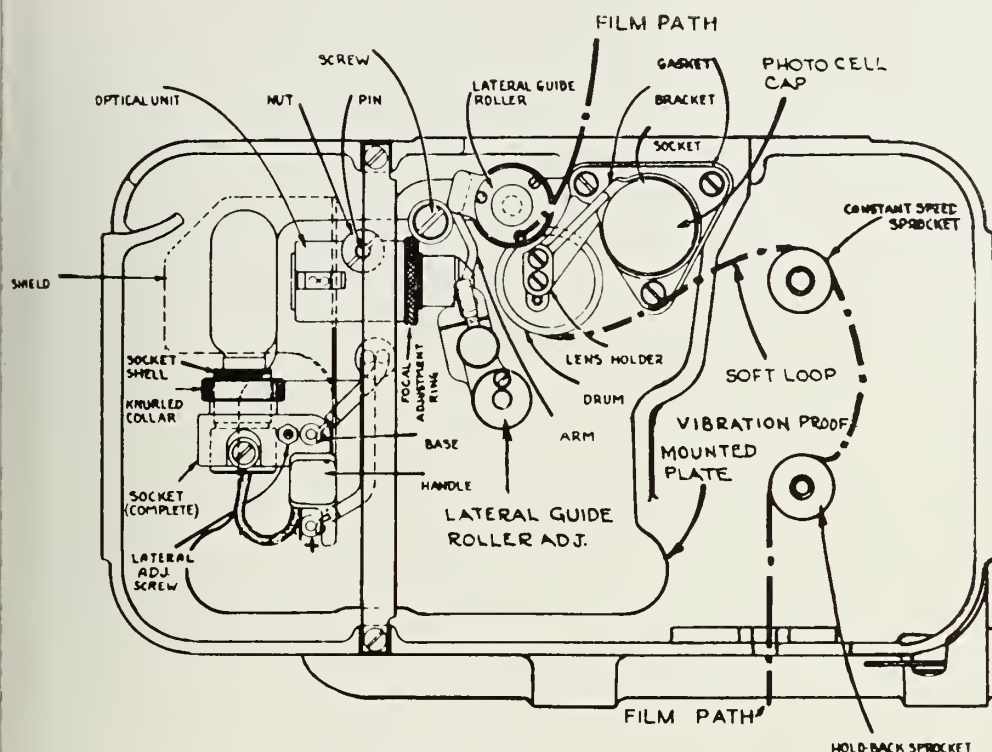


FIG. 5

phonic noises into the system.

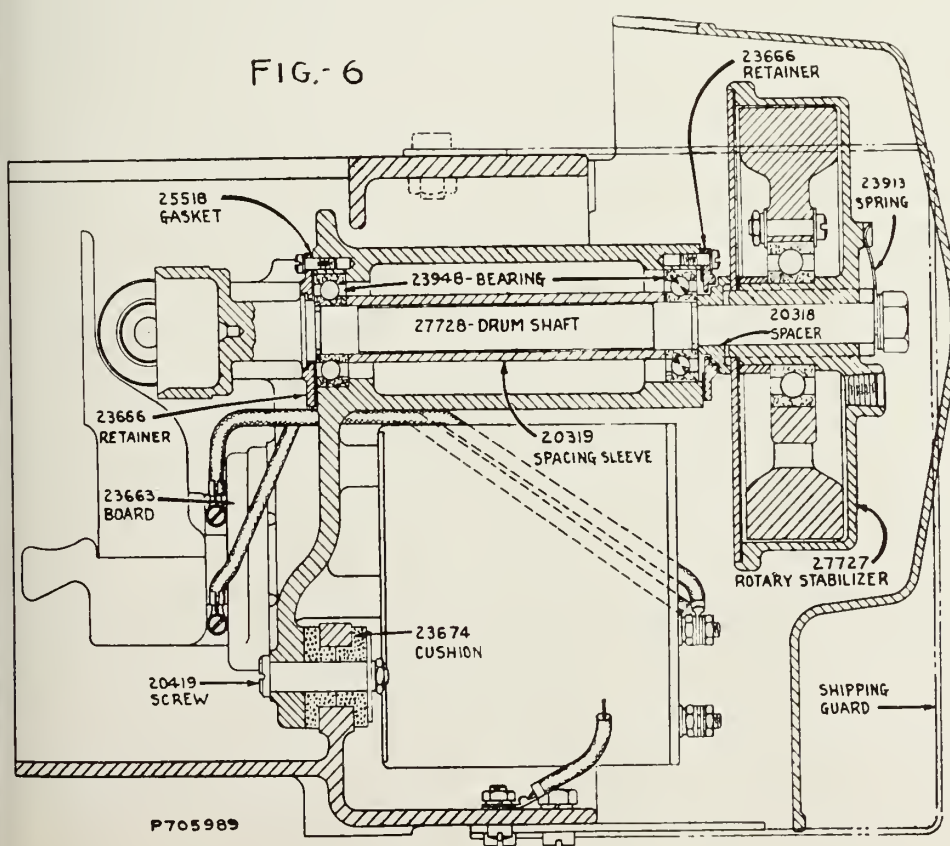
The rotating drum will not collect wax and dirt and does not impose a strain on the film as there is no sliding of the film between shoes and gates; consequently the sound is reproduced free of all disturbances and speed irregularities.

Maintenance of equipment of this type is low as there are no springs and shoes on the gates requiring replacement and wear on the sprockets

is reduced to minimum due to the light pull required to propel the film through the sound-head.

From the soundhead scanning light beam the reproduced sound goes into the photocell where it is converted into electrical energy. The November issue will take up the developments of photocells and photocell circuits.

FIG. 6



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Agfa-Anseo Corp.
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C. King Charney, Inc.
6372 Santa Monica Blvd., Hollywood.
(HO. 2918)

Hollywood Ray Film Co.
P. O. Box 3056, Hollywood.

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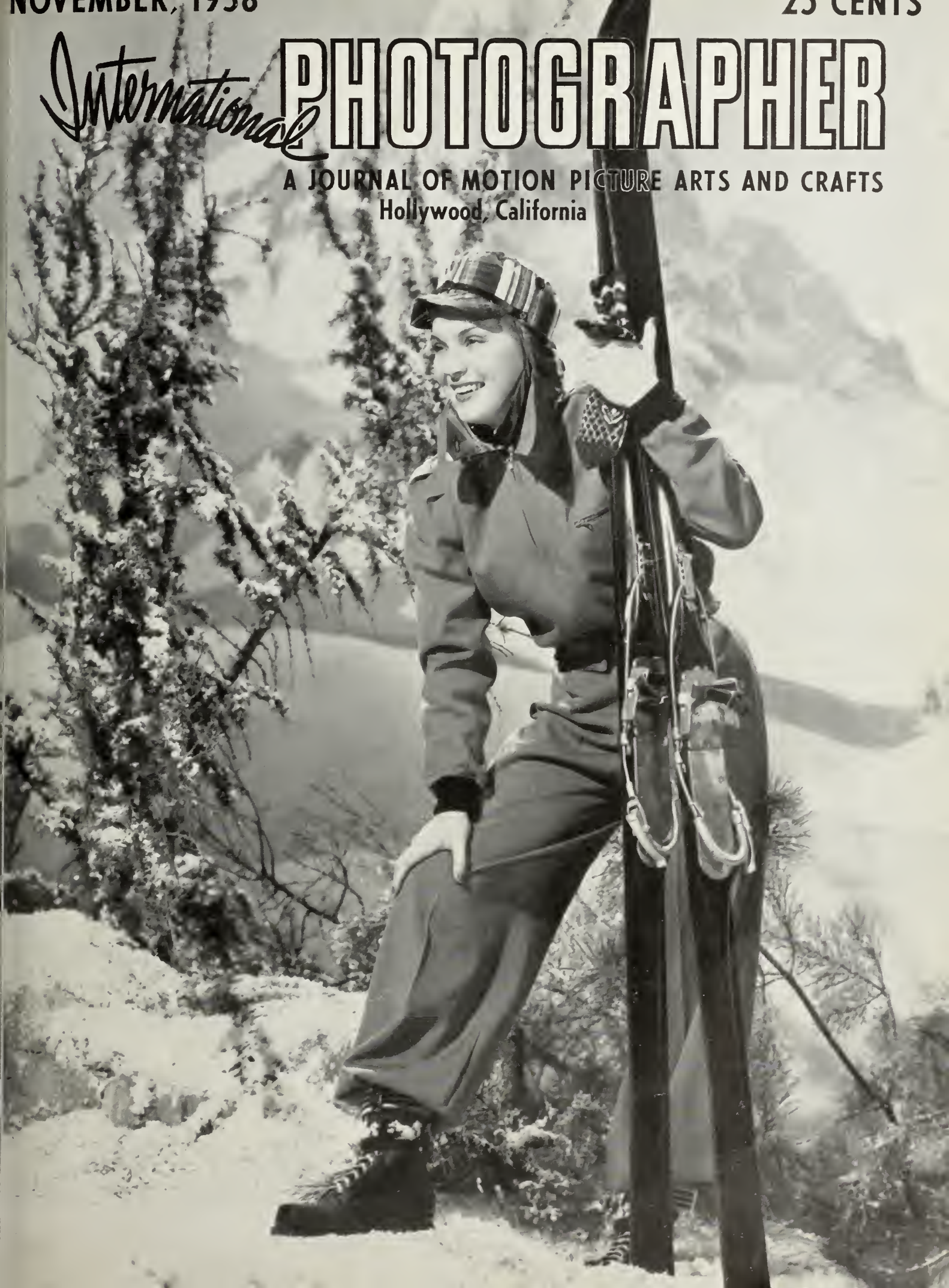
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PHOTOGRAPHY

Top Left, Eastman's new 35 miniature camera; (Page 1, Column 1) Top Right, the Eastman Table Top Tripod and Pan-a-pod; (Page 2, Column 3) Lower Left, the new Agfa Clipper Special (Page 2, Column 1) Lower Right, Eastman's new Brownie Special (Page 2, Column 2).

New Kodak 35's

THREE NEW moderately-priced miniature cameras, the *Kodak 35's*, announced this month by the Eastman Kodak Company, incorporate many technical advantages generally associated with miniature cameras in a higher price range. Automatic control of film-centering and winding, automatic exposure-counting, lenses corrected for either black-and-white or full-color photography,

and, in the models with faster lenses, a built-in self-timer and automatic device for preventing double-exposures, are among the features which will appeal to all camera users.

The *Kodak 35* with Kodak Anastigmat Special f:3.5 lens has a Kodamatic shutter with five speeds to 1/200 second, plus self-timer. The shutter is set automatically for the next picture as the film is wound. This model will retail at \$39.50. Another model, equipped with Kodak Anastigmat f:4.5 lens and Kodak Diomatic shut-

ter with four speeds to 1/150 second, also has a built-in self-timer and a similar fully-automatic device for preventing double exposures. This model, with f:4.5 lens, will retail at \$29.50. Both of these cameras have a convenient clip for attaching a *Kodak Pocket Range Finder*.

A third *Kodak 35*, equipped with Kodak Anastigmat f:5.6 lens, has a Kodex shutter with three

speeds to 1/100 second, and will retail at \$18.50. It, too, has automatic film centering and winding control, and its lens is corrected for full-color photography as well as black-and-white.

Each of the *Kodak 35's* is equipped with a folding optical eye-level view finder, and a one-piece bottom and back which may be unlocked and slid off for full access to the interior of the camera. This feature makes loading rapid and easy, and facilitates cleaning of the camera. All three *Kodak 35's* have convenient finger-tip focusing from four feet to infinity by revolving the lens mount.

Lenses of the *Kodak 35's* need not be pulled forward into position before a picture is taken. They are permanently extended on a compact tubular mount of extreme sturdiness. This feature keeps the camera ready for instant action. Lenses are deeply recessed in their mounts, for protection. The camera bodies are shaped for firm holding and comfortable "feel," and are finished in black pin-seal grain molded into the newly developed and extremely tough damage-resistant material, with bright metal and black lacquer trim and fittings.

Delivery of *Kodak 35's* will begin next month.

AGFA f.6.3 Clipper Special

THE AGFA PD16 Clipper Special camera, an entirely new camera with a modern design similar to that of the popular Agfa Clipper introduced earlier this year, has just been released and is now being shown by photographic dealers. The new Clipper Special is fitted with a fully corrected focusing f:6.3 anastigmat lens and a shutter giving 1/25th to 1/100th second exposures, as well as bulb and time. The Clipper gives fifteen 2½x2½ inches pictures on a roll of PD16 film, same size as 616. A telescoping, metal, pull-out front makes the camera instantly ready for use. This new type of construction does away completely with the necessity for bellows and is consequently "light leak-proof." The Clipper is solidly built with a pressed-steel frame, and smartly finished with a black-grained, waterproof covering and exposed metal parts finished in polished metal and black lacquer. Other specifications include an optical, direct-view finder, tripod socket, a convenient depth of focus scale, a hinged back and easy loading arrangements, and special eyelets for attaching a neckstrap.

Professional Kodachrome

THIS MONTH *Kodachrome Professional Film* for direct-color photography is available in cut-film sizes up to and including 8x10 inches, and in a type precisely color-balanced for high intensity tungsten illumination.

Identical in principle with the *Kodachrome* which has proved so successful for miniature cameras, *Professional Kodachrome* differs only in its suitability to professional and studio photography.

Kodachrome Professional Film is used with the same ease and simplicity as No. 135 and 828 *Kodachrome Film* for miniature still cameras. It is suitable for use in any camera which takes standard black-and-white cut film. Film holders are loaded, and single exposures made, in the usual fashion. A single exposure produces a positive transparency in full color. Any fully color-corrected anastigmat lens capable of good three-color work is suitable for color photography with *Kodachrome*.

The simplicity with which *Kodachrome* may be used is due to its structure. Though a single film, it has three separate emulsions—each selectively sensitized to a different part of the spectrum. Dyed layers of gelatin over each emulsion act as color filters and record the colors of the subject as negative silver images—in perfect, permanent register. In processing these negative silver images are converted into a full-color positive. *Professional Kodachrome Film* will, for the present, be processed only at the Eastman laboratories in Rochester.

CHARACTERISTICS—PROFESSIONAL KODACHROME FILM, TYPE B

USE: Single exposure in regular camera produces positive transparency in full color, without screen pattern.
 LIGHTING: Balanced for high intensity clear Mazda Lamps.
 FILTERS: None, when appropriate type of artificial light is used, Wratten 85-B for outdoor pictures.
 SPEED: Approximately one-third that of Eastman Portrait Panchromatic Film or Eastman "SS" Pan Cut Films.
 EXPOSURE LATITUDE: Moderate.
 PROCESSING: At Rochester only, without charge if three or more films are returned for processing at one time.
 SIZES: Popular sizes up to and including 8 x 10 inches.

Kodachrome transparencies are free from screen pattern, and have the extreme fineness of grain characteristic of the reversal process. The transparency may be examined as a proof, used for engraver's copy, used for the production of full-color prints on paper, by the wash-off relief method or other suitable medium, or for screen projection with suitable equipment.

Professional Kodachrome Film for studio use under artificial light will be known as Type B, and will require no filter when used with light of correct color-quality.

The Type B film is color-balanced during manufacture for light from incandescent lamps operated at a color temperature of 3200 degrees K. This type of light represents the average quality of light normally used for black-and-white commercial photography—that obtained from clear bulb, high efficiency tungsten lamps operated at correct voltages. Thus, photographers can use *Kodachrome, Type B*, with no change whatever in their standard tungsten lighting equipment.

Type B Kodachrome should not be associated with 16mm or 35mm *Type A Kodachrome*, which is color-balanced for photoflood and photoflash illumination of higher color-temperature. However, *Type B* can be used with photoflood or photoflash, if a Wratten 2A Filter is placed on the camera lens to compensate for excess blue of these light sources. Pictures can also be made outdoors by daylight if a Wratten 85-B Filter is used. Full information about the use of filters is given in the instruction book packed with each box of film.

While *Kodachrome Professional Film* does not have the high speed or great latitude of some black-and-white films, it does have moderate exposure latitude. Its speed is approximately one-third that of *Eastman Portrait Panchromatic*. In addition to the Type B film for studio use, a Daylight Type will be available later in a similar range of sizes.

Professional Kodachrome Film is supplied in boxes of one-half dozen, each box including an instruction book and a gummed return label. When fewer than three films are returned for processing at one time, a service charge of 50 cents is made. A coin envelope is included in each box for that purpose. If three or more films are returned at one time, there is no charge for processing.

New Brownie Specials

TWO NEW BROWNIE SPECIALS, Six-20 and Six-16, are announced by the Eastman Kodak Company. They differ markedly from other inexpensive cameras both in appearance and construction, and are planned for extreme sturdiness combined with greatest convenience for inexperienced camera users.

The *Brownie Specials* are made with tapering fronts and curved backs. This design permits unusual compactness, and produces a camera unusually easy to hold. The camera case and film holder are of steel, and outer metal parts are finished in smooth black japan, with panels covered in tough, scuff-resisting black pin-grain Kodadur.

Controls are placed for greatest convenience.

The view finder is of long, tubular "spy-glass" type, particularly easy to use because of the clear brilliant image it provides. It is mounted on top of the camera, and used at eye-level, thus insuring pictures which have the normal point of view as seen by the picture-taker.

Focus is pre-set, with all objects beyond 10 feet for the Six-20, and beyond 15 feet for the Six-16 in permanent sharp focus. For pictures of near subjects, a supplementary lens is brought into action by pushing a lever just below the lens mount. An ingenious safety catch locks the shutter release so that exposures cannot be made accidentally. Time exposures can be made when a lever at the side of the lens mount is lifted. Fabric carrying cases with shoulder straps and slide fasteners are available.

The *Brownie Specials* are suitable both for day light pictures and for Photoflood snapshots at night when loaded with the new high-speed Kodak Super-XX Film. Prices are: Six-20 *Brownie Special*, \$4; case, \$1.10; Six-16 *Brownie Special*, \$4.50; case, \$1.25. The Six-20 takes pictures 2¼ x 3½ inches, and the Six-16 takes 2¼ x 4¼-inch pictures.

New Eastman Aids

THREE NEW accessories for either miniature cameras and larger-size models are available from Eastman Kodak Company.

The *Kodak Table Top Tripod* is a camera support for table-top photography, still-lives, and many other indoor pictures. It is used on an convenient support—table, chair, or floor. The device also will prove useful in many outdoor picture situations.

Legs of the *Table Top Tripod* are sturdy and without joints. They unscrew from the solid metal head. The outfit can be carried easily in a pocket. The tripod has a leg-spread of 9½ inches, and is 7 inches high. Each leg is rubber-tipped, non skid, and will not scratch or mar polished surfaces.

The *Kodak Pan-a-pod* is a revolving head, for use on the *Table-top Tripod* or any other tripod with standard screw. It insures a smooth, easy swing in either direction when panoraming with a still or motion-picture camera. The *Pan-a-pod* carries degree markings, helpful in making "panorama" pictures with a still camera. For a panorama, a series of pictures is made, the *Pan-a-pod* being turned the proper number of degrees after each picture to allow a slight overlap. Almost a full circle can be pictured with the device. A locking screw holds the center of the *Pan-a-pod* head at any selected setting.

The *Tilt-a-pod* is an adjustable camera support for use on any standard tripod. With it, a still or movie camera can be tilted to any desired angle and held firmly there with a turn of the locking screw. The device is rigid when locked, permitting long exposures without camera movement.

These devices may be used separately, or in combination. They are styled to make an attractive combination, and, when so used, provide a versatile aid for picture-making. Prices are: *Kodak Table Top Tripod*, \$1.75; *Kodak Pan-a-pod*, \$3; *Kodak Tilt-a-pod*, \$2.50; all three in combination \$7.

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS and CRAFTS

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VOL. X.

Contents for November, 1938

No. 10

On the Cover: As early as July studio still departments start posing stars for the fall and winter holiday spirit art. Here is a beautiful shot from the Universal still department's portfolio of wintry scenes. The player is Nan Gray and the picture was made by Ray Jones, member of Local 659, IATSE, and chief of the Universal department.

Tradewinds

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News of New Products

News of the Month

9-20

Sensational New Eastman Films

45 Degree Camera Track

Shipser's Stereoscopic Process

Studio Mechanic's Handbook—Haines

Studio Clubs Plan Joint Holiday Event

Research Insures Accuracy—Wallace

SMPE Fall Convention

Technical Articles

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Academy Test Reel

Patents—Fulwider

Photoelectric Cells and Circuits—Thompson

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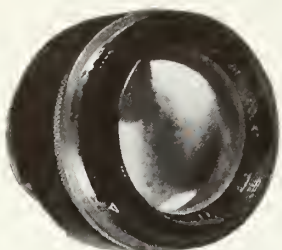
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Super-XX in Popular Sizes

FOUR TIMES AS FAST as ordinary films, and heretofore available only for miniature cameras, Kodak Super-XX, one of Eastman's new series of emulsions, now is obtainable in all the popular roll-film sizes and in film pack.

So sensitive is the new film that an inexpensive box camera, loaded with it, is about equivalent in speed to a camera with f.6.3 lens when loaded with ordinary film. Similarly, the f.6.3 camera, loaded with Super-XX, has a speed which approximates that of a camera equipped with f.3.5 lens when ordinary film is used.

Intended for the shortest possible exposures and for use under adverse lighting conditions, Kodak Super-XX is especially adapted for picture-taking by artificial light. Almost any camera loaded with it can take indoor snapshots by the light of only two Photofloods—one No. 2 and a small-sized No. 1—placed as specified in the Kodak Snapshots-at-Night instruction folder.

Argus Enlarger Radical

A NEW SYSTEM of illumination, employing reflected light rather than conventional direct diffused light, is embodied in a new 35 mm enlarger just announced by the International Research Corporation of Ann Arbor, Mich., manufacturers of Argus Cameras and photographic equipment. Coolness in operation, greater protection to negatives, and flat-field illumination, with full brilliance to all parts of the negative, are provided by this development, the manufacturers state.

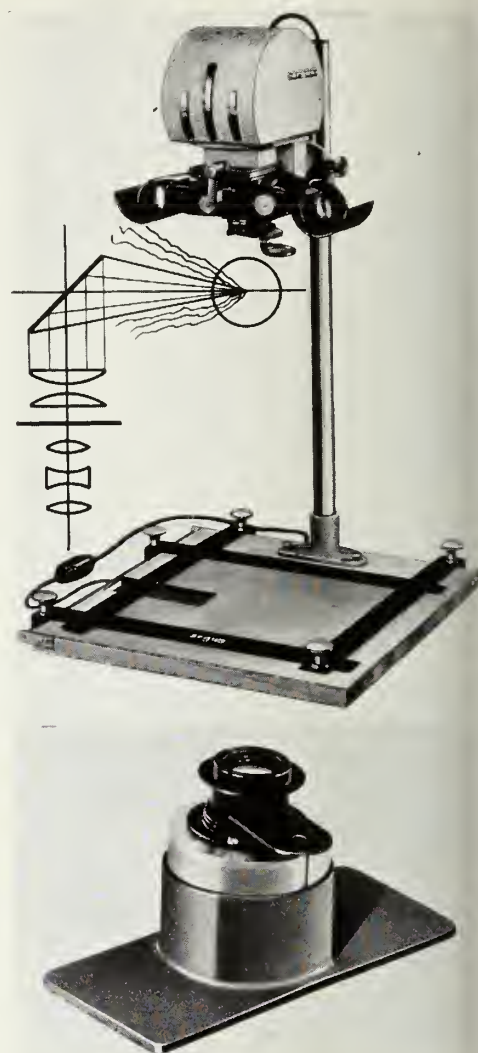
Designed for use with Models A and AF Cameras, or with a special enlarging lens and adapter mount, the new enlarger uses five lenses. When the camera lenses are used, f:4.5 aperture is provided. The camera diaphragm can be opened or closed to control light. When the Argus adapter lens and focusing mount are used, an f:5.6 triple anastigmat lens, with an aperture slide with f:8 and f:16 openings, is at the operator's command.

An outstanding feature is the moulded bakelite book-type film holder. There is no glass in this unit. It is non-scratching and dust-free. It may be removed and inverted for 11x14 prints. It handles either single negative or strip film. Positive film tension is released with a full cam lever for moving film.

By the use of a 100-watt prefocused projection lamp with its concentrated filament, the source of illumination for this new system closely approaches the ideal "point light" source for which enlarger designers have long striven. This small but extremely brilliant lamp is placed at right angles to the optical system and the center portion only of the lamp where the flattest and evenest illumination is available is picked out and reflected down through the condensers. This eliminates unwanted distorted light waves and permits placing of light source at a much greater distance from negative, making it possible to use more light with less heating. The reflecting medium also absorbs considerable of the light heat waves and provides all the diffusion needed without use of frosted or opal glass in the optical field—tending toward better definition and the flatter, more brilliant field so much needed in miniature enlargers.

While the enlarger is designed to use either Argus Model A or AF Camera for the objective system, an f:5.6 triple anastigmat is furnished as separate equipment for those having other makes of cameras or who want a complete enlarger.

When the Argus is used for the lens system, the picture is then printed back through the same lens which originally made the negative, so that five lenses are actually used, three in the focusing mount and two in the condenser system. The



Top, the new Argus EAE Enlarger with a diagram of the radically new system of illumination; Bottom, the adapter lens that goes with the new enlarger.

f:5.6 lens used in the separate adapter is also a triplet anastigmat precision lens, mounted and quickly attached. This mount provides three working apertures, f:5.6, f:8 and f:16.

Another innovation in design is a new type fast-loading framing easel which handles paper up to 8x10 on a 14x14 baseboard. The easel can be loaded without raising the masking arms.

Considerable attention has been given construction of the removable film holder to prevent scratching negative and to eliminate dust. The film is held under positive spring tension and released by a cam and lever arrangement. By inverting the film holder, the film is moved with respect to the lenses so that 11x14's or even photomurals up to 40 inches wide can be made. Either single negatives or film strips of any length are handled.

A swinging, built-in red filter is standard equipment. The lamp house, exceptionally compact of gray crystalline finish with chromium an brilliant red plastic trim, can be swung on its mounting arm for table-edge enlargement work. This is essential in photomural work. Enlargements up to 30x40 inches are easily attained in this manner.

List prices of the enlargers are: Model EAE with plain base, \$14.75; Model EAE, with framing easel base, \$17.50; Model EAL, with plain base and EAL-200 adapter mount and lens, \$18.50; Model ELE, with framing easel base and adapter mount and lens, \$21.25; EAL-200 adapter mount and lens, \$4.75.

Enlarger also Projector

THE OPTILITE Photo Enlarger, a new machine, combines scientifically controlled enlarging facilities with a tilting arrangement which makes the unit readily adaptable for projection purposes. It is distributed by Intercontinental Marketing Corporation of New York.

In addition to this novel and money-saving convertible feature, the Optilite Enlarger has a special patented scratch and dust-proof film holder, a scientifically designed cooling system, and separate precision focusing adjustments for lens and projection bulb. Films are given bright, equal illumination by means of a 50-candle low voltage bulb and double condensers.

The Optilite will be available in Junior and standard and DeLuxe models, both taking negative sizes from 35 mm to 2¼x3¼ inches.

Perutz Control Numbers

SINCE NUMBERS along the edges of 35 mm film often fall between negatives and become confusing, positive identification of each negative has been made possible by the system used on Perutz daylight spools and cartridges. Intermediate numbers, such as 1, 1a, 2, 2a appear on each film load. This not only speeds up negative selection, but gives users of the Robot, Tenax and similar cameras and single-frame cameras a separate number for each picture.

Rogers with Ampro

F. B. ROGERS has joined the Ampro sales organization and will serve as Divisional Sales Manager with headquarters at the New York office of The Ampro Corporation, 56 West 45th Street, New York, New York. Metropolitan New York will be handled intensively by Mr. Harry S. Milner.

STUDIO TECHNICIANS

We extend a cordial invitation to visit our showrooms and become acquainted with a mass production telescope manufacturing organization, which offers a special service to the motion picture industry as a basic part of our facilities.

American Telescope Laboratories, Inc.

We are in a position to produce on very short notice any optical parts, either special or standard, required in the motion picture industry. We specialize particularly in intricate and unusual work and have staff technicians thoroughly qualified to advise on every conceivable problem dealing with optics. Ours is the only local establishment fully equipped and qualified to manufacture any sort of special lenses, prisms, optical flats, mirrors, reflectors, etc., to any specifications.

Rapid Studio Service

From conveniently located laboratories at 5870 Hollywood Boulevard near Bronson; Telephone: GRanite 8707.

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President

REX W. BEACH
Vice-President

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years of technical knowledge and experience
developed the

MITCHELL CAMERA

the standard of quality in the motion picture
industry.

The same technical knowledge and experience
has developed the

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which in the short time it has been available is
already reaching the same high place in the talk-
ing picture field



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D. Nagase & Co., Ltd., Osaka, Japan

Motion Picture Camera Supply Co., New York City
Bombay Radio Co., Ltd., Bombay, India
H. Nassibian, Cairo, Egypt

Eastman Lens for Color

UNPARALLELED CORRECTION for lateral as well as longitudinal color is claimed for a new long-focus lens of the EKtar series, just announced from Rochester by the Eastman Kodak Company. The new lens, an Eastman Anastigmat EKtar f:6.3 of 14-inch focal length, is designed for users of commercial and view cameras who require a lens "unequaled for the making of color separation negatives in accurate register." It is held to solve problems of photographers whose present "color-corrected" lenses are unable to produce color-separations that will superimpose properly.

"Special attention," Eastman states, "has been given to correction of lateral color which is par-

ticularly important in the making of color separation negatives. Numbered test plates are made with each lens and filed for reference."

Longitudinal color-correction insures that a lens will image objects of different colors sharply in the same film plane. Lateral color-correction insures that the three different colored images of the same object will be exactly the same size, so that each negative of a color-separation set will register correctly with the others and color-fringing be avoided in the final reproduction. Until the new EKtar was designed, the company claims there was "no lens offering guaranteed complete lateral correction . . . available for commercial work."

The 14-inch Eastman Anastigmat EKtar f:6.3 lens is mounted in a new-type light-weight all-

aluminum barrel with "click" stops for positive diaphragm operation. Its wide coverage, the announcement states, allows full use of the adjustable front and back of 8x10 cameras. For protection against damage, a strong velvet-lined box and two lens caps, front and back, are supplied with each lens. Mounted in all-aluminum barrel, with lens caps and protective box, the Eastman Anastigmat EKtar f:6.3 lens—14-inch—is priced at \$175.00.

Agfa Tripods

DESIGNED ESPECIALLY for the use of amateur photographers, two new tripods possessing several distinctive features have just been announced by Agfa Ansco Corporation of Binghamton. The tripods are constructed of a carefully planned combination of cold rolled steel, forged aluminum, and machined brass for lightness and rigidity. They have four sections, telescoping legs that open quickly to extended position. The legs have a five-sided design that results in unusual rigidity and resistance to wobble or side-weaving. When closed, the legs form a compact, nine-faceted circle, one inch in diameter.

The Number 1 metal tripod which is furnished with a stationary head, measures 15 $\frac{3}{8}$ inches in length when closed, yet extends to a height of 48 inches. Its weight is 19 ounces. The stud of the Number 1 tripod is of the reversible type and can be adapted for either American or Continental tripod sockets by the removal of one screw.

The Number 2 metal tripod provides a ball and socket swivel head that permits locking the camera at any angle, including straight up or straight down. The weight of the Number 2 tripod is 23 ounces. Its length is 17 inches closed, while it extends 49 $\frac{3}{8}$ inches opened. Both tripods are equipped with removable rubber tips that fit over the metal pointed feet and prevent scratching or slipping on polished floors. The Number 1 tripod retails at \$3.95, and the Number 2 tripod at \$4.95.

Price Cuts

BOTH BELL & HOWELL and the DeVry company are making substantial price reductions in their lines, particularly in projectors. Further information may be obtained from the manufacturers and their dealers.

New Argus Model C2

A NEW ARGUS Model C2 Speed Camera with Coupled Range-Finder, is being placed on the market at \$25.00, with the dropping of Model C, brought out this spring, from \$25 to \$20.

The new calibrated, built-in, split-image sextant-type range finder accurately sets focus, with no need to lower the camera from the eye. Once range is found, operator can shoot instantly. The coupled range finder more than doubles speed in taking fast candid shots. As in the Model C, all controls are under two fingers, extremely convenient and making the C2 one of the simplest cameras to use. Exceptionally clear and distinct image appears through the range-finder eye-piece in full size. The view finder has a perfect infinity focus.

The new 50 mm "CINTAR" f:3.5 Anastigmat lens which comes on the C2 as standard equipment is rated ideal for miniature camera work.

Lighting News EXTRA

ON THE SET

EVERY DAY

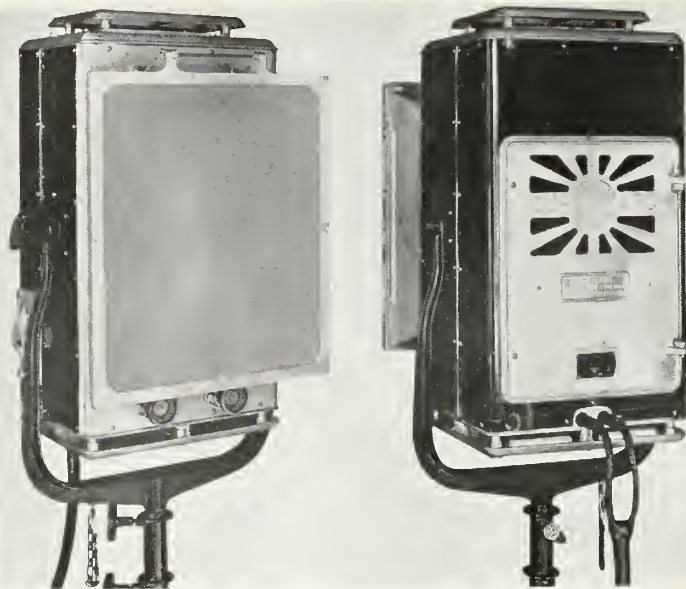
DUARC THE FAVORITE

**M-R ENTRY
FAVORED
IN COLOR
SWEEP**

Going to the post a heavy favorite, Duarc, classy entry from the celebrated Mole-Richardson stables is touted as a sure winner in the season's forthcoming Technicolor sweepstakes. In early-season workouts on both testing and production tracks, the M-R colt showed exceptional form, consistently smashing previous track records.

Running this season in place of Side Arc and Scoop, former heavy winners for the same stables, the Duarc filly is well thought of for past performances. Studio cameramen and electricians especially have bet Duarc heavily across the board.

"We can't lose," was general comment. "The older ares couldn't last the course when going got tough, especially when run in high position where trainers couldn't get at them. This Duarc pony, now, has repeatedly run half a day unattended, in the fastest company. It's a sure winner!"



FAVORITE IN EARLY-SEASON WORKOUT

LONG LINE OF

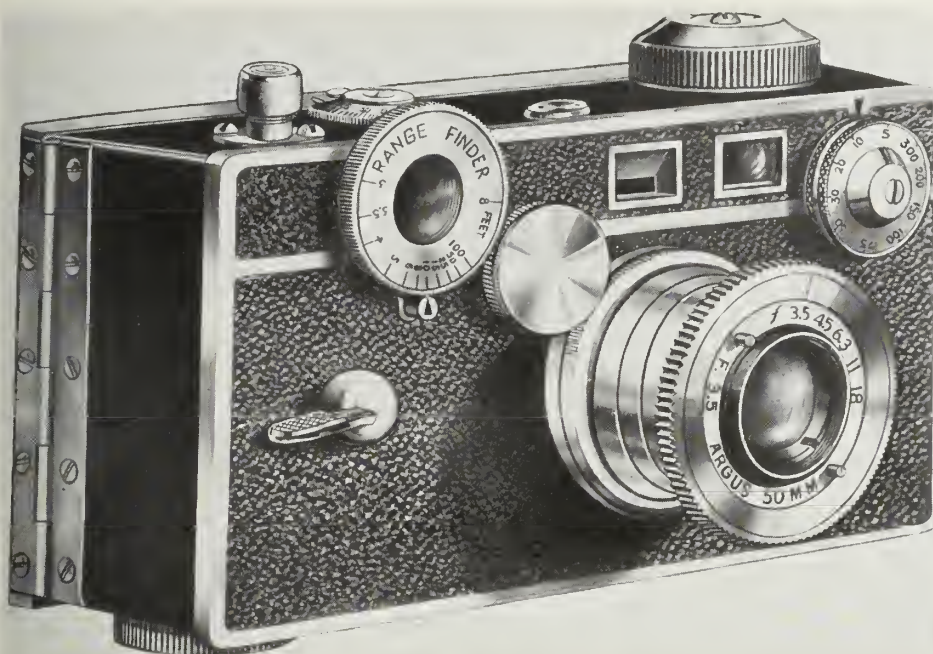


CHAMPIONS

**DUARC
H. I. ARC
SOLARSPOT
SIDE ARC—SCOOP
and ORIGINAL INKIES**

All Came from the Plant of
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HOLLYWOOD, CALIFORNIA

Early-season workouts of Duarc, the new M-R stables pacemaker, showed lots of form. More recent runs, timed against records made by Side Arc and Pre-Vitaphone Broad, champs in their day, showed Duarc not only beat their best time (boosting record from 10 minutes to 2 hours, 10 minutes, 22 2/5 seconds), but showed consistently steadier performance, without a ghost of flicker. Older entries regularly flickered all over the track, but the Duarc keeps steady under any conditions.



The new Argus Model C2 with coupled range-finder. (Column 6, Page 3.)

providing all the speed required while retaining necessary sharpness and depth of focus. The lens is fully color corrected and is designed to produce clear crisp negatives that will stand enlargement to 11x14 and greater. Equipped with a front-operated iris diaphragm, entire objective system moves as a whole in a helical tube mount and focuses from 3½ feet to infinity. Each lens is individually tested and certified.

Interchangeable mounting of the lens permits use of various types of lenses and attachments which vastly widen the camera's range of use. Among recent Argus additions to available accessories for this model are the Macro Attachment for close-up photography of small objects, and a new copy lens and portrait attachment.

The shutter is behind the lens, of a new jar-proof design with a continuous range of speeds from 1-5 to 1-300 of a second and "bulb."

As illustrated, the camera presents a modern external appearance similar to the Model C, being well-proportioned and handsomely trimmed in metal and polished plastic, with black morocco leatherette covering. The body is designed to fit the hands conveniently, and all controls are conveniently located at the finger tips for ease and speed of operation.

Transparency Mounts

TWO NEW TYPES of projection slides for users of the Robot, Tenax and other cameras of one-inch square negative size are announced by Intercontinental Marketing Corp. of New York.

One of the new mounts is of glass and metal, and can be quickly taken apart for insertion or exchange of transparencies. The metal frames lock together without mess or possible damage to the film. Mounts are packed in lots of 25, in a carton which may be used for storing the slides after they have been filled.

The second type is a permanent mount consisting of two heavy cardboard frames, gummed on the inside, which hold the glass and film securely between them. Slight moistening of one frame seals the two frames together, providing dust-free protection. The cardboard acts as a shock-absorber in case of accidental dropping.

New paper masks for one-inch square film are also available, packed 144 to the box. These masks have a gummed inner surface, and hold the transparency firmly against the glass when applied.

Special Optics Service

A NEW HOLLYWOOD organization opened its doors this month featuring a by-product of its production setup of particular interest to the motion picture industry. American Telescope Laboratories, Inc., will engage in mass production in Hollywood of a complete line of telescopes, for the first time denting the virtual monopoly of the foreign firms in that field. The new line-up, part of which is illustrated on Page 7, will sell at prices one-tenth to one-twentieth under comparable foreign made telescopes.

Having determined that the only practical manner of engaging in the business was to do their own optical work, the founders of the company, J. H. Magid and Rex W. Beach, have entered the field to such an extent that they are able to produce on short notice any optical parts, either special or standard, required for motion picture production.

The organization announces that they are "fully equipped and qualified to manufacture special lenses, prisms, optical flats, mirrors, reflectors, etc., to any specifications. We specialize in intricate and unusual work and possess on our staff technicians thoroughly qualified to advise on any conceivable problem dealing with optics."

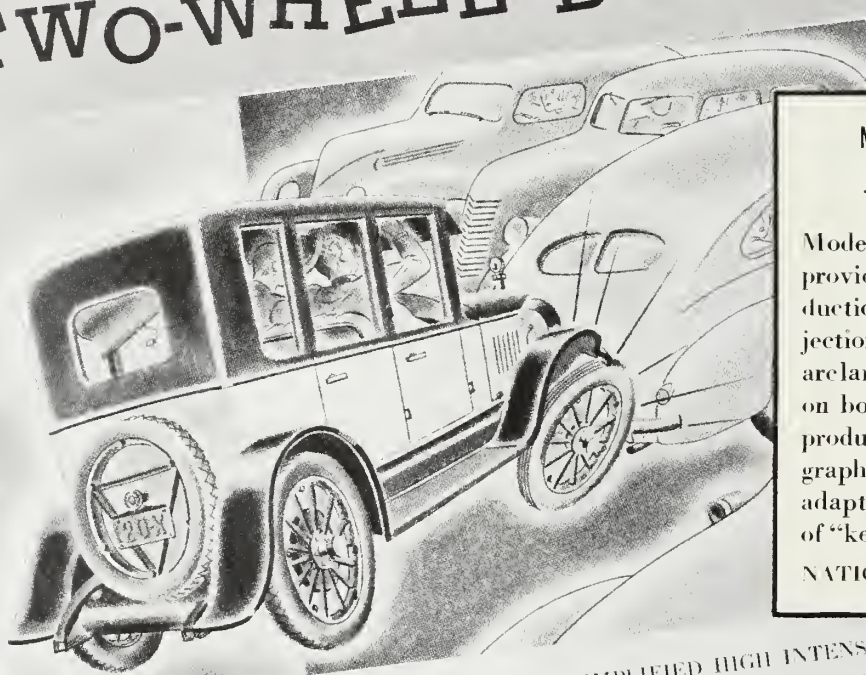
The new organization has showrooms located at 5870 Hollywood Boulevard near Bronson and extends through INTERNATIONAL PHOTOGRAPHER a cordial invitation to all studio technicians to visit their new establishment.

Astronomy is following the same trend as photography in capturing public fancy as an interesting hobby, and the principal business of the new firm will be to cater to all angles of this interesting science, supplying telescopes of all types from those for the tyro to more complicated instruments for experts, schools, colleges, observatories and for military and naval work.

New line-up of Hollywood-made telescopes from American Telescope Laboratories, Inc., new organization, which offers as a sideline, complete production facilities in optics to motion picture industry. The new Hollywood firm's standard product sells at prices from \$135 to \$550, drastically cutting in on monopoly of foreign manufacturers.



ARE YOU DRIVING A CAR WITH TWO-WHEEL BRAKES?



LOW INTENSITY PROJECTION, like a car with two-wheel brakes, is not adapted to the modern tempo of the motion picture industry. It doesn't give your business the security which you desire. Theater goes want brighter screen illumination than it provides, a more comfortable level of general illumination, and more accurate reproduction of color. They are getting these advantages in the thousands of theaters now equipped with high intensity projection. These are the houses that are doing a capacity business.

SIMPLIFIED HIGH INTENSITY projection puts these same advantages within your reach. It will enable you to hold your present patronage and increase box office receipts. Yet the cost is surprisingly small.

Write for the free, illustrated booklet, "The Eternal Triangle in Picture Projection." It gives a clear demonstration of the Box Office value of improved projection. Then ask your dealer's salesman to show you how little it will cost.

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PROJECTION

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MODERNIZE STUDIO as well as THEATER LIGHTING

Modernized carbon arc lighting provides improved light for production, just as it does for projection. The new studio carbon arc lamps are gaining acceptance, on both monochrome and color production, as sources of photographic light especially well adapted to the modern technique of "key" or "precision" lighting.
NATIONAL CARBON CO., INC.

International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

NEWS OF THE MONTH



This effective shot of the 45-degree camera track built at 20th-Fox for a spectacular Technicolor shot is fully described in the accom-

panying story on next page. The still was made by Milt Gold, member of Local 659, IATSE.

CINEMATOGRAPHY

Eastman Super Films Ready

Sensational performance of new Plus-X, Super-XX and Background-X in advance studio tests win approval of Hollywood experts; latest advances in film emulsion progress parade.

LATEST CHAPTER in the parade of motion picture emulsion progress was the appearance last month in Hollywood of advance test material of the new Eastman lineup of super-performance professional emulsions, featuring two sensational fast films and a new type of improved Background-X. The new films, which met with general enthusiasm from studio experts, will reach general trade release this month.

Highlights of the new stocks are presented here and will be followed in succeeding issues by complete technical data on the new emulsions, their performance, processing, etc. The new fast emulsions parallel similar "Plus-X" stocks made available in slightly different form to the amateur miniature camera field two months ago.

Plus-X, already widely tried out with success in Hollywood last month, is an emulsion with twice the speed of the familiar Super-X, with the same general color sensitivity, with finer grain but similar developing characteristics.

Super-XX has twice the speed of Plus-X, and four times the speed of Super-X, although with this great speed increase, virtually the same grain as Super-X and with approximately the same color sensitivity. It requires from one to two minutes longer development to attain similar contrast to the regular Super-X, since the high speed obviously produces a flatter picture.

The third new emulsion from Eastman is known as Background-X and is a special emulsion for outdoor photography and not for rear projection as the same might indicate. It has outstanding fine grain quality with approximately 80 percent the speed of Super X, which gives it double the speed of ordinary background film so-called.

45 Degree Track

Stroehm devises unusual camera dolly setup at 20th for special race track scenes.

THE SEARCH FOR NEW and more unique camera angles added another new bit of technique to the art of cinematography which will be seen for the first time in the Technicolor production, "Kentucky," which is now filming at 20th Century-Fox.

Director David Butler had filled a grandstand with people watching a horse race, and he wanted some means of getting a traveling

shot from the back of the grandstand, coming down at an angle until it would rest on such principals in the cast as Loretta Young, Richard Greene, Walter Brennan and Moroni Olson.

After the cameramen had worked out the idea, it was presented to Walter Strohm, the

studio's chief engineer, who perfected it on a scientific and technical basis.

A stout scaffolding was built on which tracks were laid, running down at a 45 degree angle. A special camera platform was built to run on these tracks, and an electric hoist, such as is used in running elevators, was used to work the cables which let the platform down or hoist it up again.

Many shots were made with the camera traveling from a height almost down to the ground at a 45 degree angle with varying rates of speed which could be controlled.

Main reason for the "science and engineering" emphasis was because the Technicolor camera equipment used is valued at \$75,000, and no chances could be taken on anything going wrong, or of injuring players and technicians in the path of the heavy equipment.

New Stereoscopic Method

Louis H. Shirpsier, Los Angeles inventor, completing experiments with radical system that eliminates gadgets and places third-dimensional effect on single film strip.

ENTIRELY NEW slant on stereoscopic motion picture photography is being experimented with by Louis H. Shirpsier in Los Angeles. The inventor, brother of Cliff Shirpsier, member of Local 659, IATSE, has been perfecting various types of stereoscopic approaches since 1917 and is now in the final stages of developing a radically different instrument, principal feature of which is that the images go through one lens to a single film and no attachments are used by the spectator for viewing.

As most experienced technicians know, the subject of stereoscopic motion pictures ranks with natural color, television, binaural sound and similar perennial goals of the experimentally minded, as having been tried from scores of approaches, with many failures. Shirpsier feels that he is on the right track in solving the many practical problems surrounding the commercial application of stereoscopic effects to motion pictures. He also has adapted the same principles for television and for viewing boxes for medical and dental X-ray pictures. He has applied for more than 30 patents on his device.

Shirpsier, with his brother's aid, has photographed several reels of stereoscopic shots, and the accompanying stills illustrated herewith are from 8x10 enlargements direct from the motion picture film, which was shot at the Universal studio.

Whether or not Shirpsier has actually achieved practical stereoscopic motion pictures, his ingenious approach to the solution merits attention, because, should his method be proved practical, it has already a number of practical features. It is photographed

under virtually normal production conditions with standard cameras, using standard shutter speeds, etc. There is a loss of from one-fourth to one-half light stop over normal. A single device is attached ahead of the camera lens. A similar device would go ahead of the projector in projection, but Shirpsier claims that even projection without the device will attain an approximately 75 per cent stereoscopic effect.

All processing and developing of the film follows standard studio practice. The same lighting now used for professional photography is used. There are no filters or gadgets of any kind in either the photography or projection, since the entire system is optical.

The actual device is a complicated looking metal box, approximately 8x3x3 inches. It contains a multiplicity of mirrors, arranged for individual control of each mirror, and so that three separate images are sent through the camera lens and onto the film. The film records three separate images; there are three distances of focus, three densities and three angles. The two outside images are balanced off the center image, and can be regulated by viewing through a ground glass to the proper formula for photographing the scene. Shirpsier plans a pre-set final formula with possibility of variations if necessary.

Believing that the inventor's long study and work on the problem, combined with its many practical features as compared with other methods of securing the third-dimensional effect, the editors of INTERNATIONAL PHOTOGRAPHER have arranged that the new device be given a thorough trial under ideal



TWO BLOW-UPS FROM 35 MM NEGATIVE OF THE NEW STEREOSCOPIC TECHNIQUE DEVELOPED BY LOUIS H. SHIRPSER, LOS ANGELES INVENTOR, WHOSE SOLUTION OF MUCH

PLAYED WITH THIRD-DIMENSION PHOTOGRAPH EFFECT PUTS IMAGES ON ONE FILM STRIP. HOLD THESE THREE FEET AWAY FROM THE EYE TO SEE RELIEF EFFECT.

conditions, with the cooperation of a number of progressive equipment manufacturers and technicians.

Results of these experiments will be published in the next issue of INTERNATIONAL PHOTOGRAPHER along with a complete layout of pictures on the Shirpsers device in actual operation.

Camera Equipment

More fact hunting for the Studio Mechanic's Handbook.

By G. M. Haines, Local 37, IATSE.

(INTERNATIONAL PHOTOGRAPHER the past few months has been forced to leave out many interesting items through lack of space. We are pleased to pick up this month with the Studio Mechanic's Handbook and plan early resumption of others in our regular Table series.—ED.)

AFTER SEVERAL months of presenting grip equipment, which may be interesting because of the odd names and uses of the various devices, particularly to those not familiar with routine on the set, we change to camera equipment this month. This may be overly familiar to our Brother members in Local 659, but we are sure that many readers of INTERNATIONAL PHOTOGRAPHER will find it interesting.

Don't forget that publication of these pieces of equipment in INTERNATIONAL PHOTOGRAPHER is primarily for the purpose of accumulating all necessary information on these items of every-day studio use is for eventual publication as the industry's first practical handbook on the thousands of items of equipment used under modern production conditions.

We will sincerely appreciate hearing from

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of International Photographer, published monthly at Los Angeles, for October, 1938.

State of California } ss.
County of Los Angeles }

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Herbert Aller, who, having been duly sworn according to law, deposes and says that he is the Managing Editor of the International Photographer, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, International Photographer, Los Angeles, California. Editor, Edward H. Gibbons, Los Angeles, California. Managing Editor, Herbert Aller, Los Angeles, California. Business Manager, Helen Boyce, Los Angeles, California.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) International Photographers, Local 659, International Alliance of Theatrical Stage Employees and Moving Picture Machine Operators of the United States and Canada, 501 Taft Bldg., Hollywood, Calif. President, Hal Mohr; First Vice-President, Leon Shamroy; Second Vice-President, Lucien Ballard; Third Vice-President, Wm. Skall; Financial Secretary-Treasurer, Guy M. Bennett; Recording Secretary, James V. King; Sergeant-at-Arms, Len Powers.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is. (This information is required from daily publications only.)

HERBERT ALLER, Managing Editor

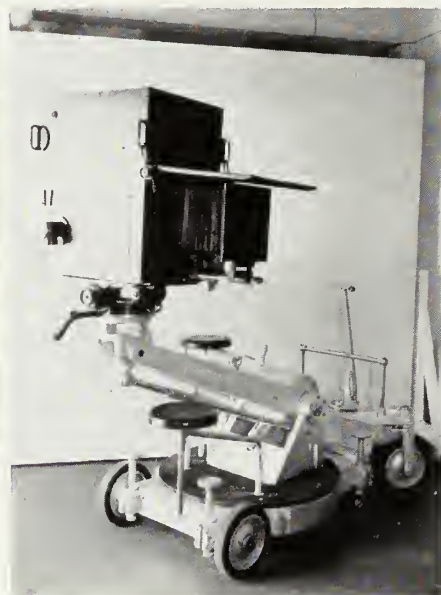
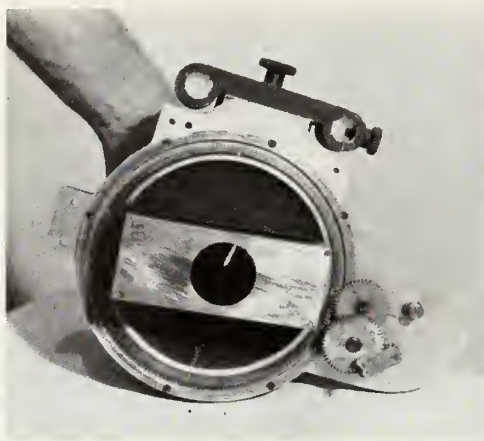
(Signature of editor, publisher, business manager, or owner)

Sworn to and subscribed before me this 4th day of October, 1938.

(Seal)

HAROLD W. SMITH

(My Commissions expires March 7, 1941)



Camera equipment shown on this page is described in the accompanying article of the *Studio Mechanic's Handbook*, by G. M. Haines, member of Local 37, IATSE.

any technicians with pertinent data on these items. As intended for final publication, each item will be pictured individually with complete descriptive data. We are particularly hopeful of securing the help of IATSE members in compiling this information, and we sincerely hope that all professional readers will accept our invitation to make suggestions or criticism on our coverage of the subject.

The particular information we are seeking includes: correct technical name; slang names used at various studios (eventually we hope to propose a workable standard terminology); size and other minimum specifications; brief description clearly defining the use of each item in studio production.

The items pictured this month are:

Top Left and Center: rear and front views of the Rotating Prisms used with the camera to secure effects of actual motion in process and similar shots; these will cause a banking effect in shots of automobile and similar scenes with rear projection and special effects.

Top Right: Camera Head on small High Hat.

Middle Left and Center: two views of a blimped camera on Velocipede.

Middle Right: Head on Baby Tripod with small High Hat alongside.

Lower Center: the Production Slate, which



is photographed before each scene for the record.

Lower Right: typical Baby Tripod.

Another point we would like to make this month is that this department is trying to eventually make this a thoroughly complete handbook, a virtual catalog of

every piece of equipment regularly used in picture making. We, therefore, would appreciate receipt of good prints of pieces of equipment, both from the many firms manufacturing equipment and from technicians who may have good close-ups of anything from cameras to baby spots.

Tri-Art Shorts

TRI-ART Film Productions is preparing a program of short subjects for release on the independent market. The organization is headed by Braheen A. Urban, veteran stage and screen player, who once was general director of the Canadian Grand Opera Association.

Alley to Lecture

NORMAN ALLEY leaves Hollywood the end of this month on a lecture tour of the eastern states extending through December and January, and Universal Newsreel has granted the ace member of Local 659, IATSE, a leave of absence to cover any period his engagements may require. Alley has placed Joe Johnson, veteran newsreeler member of 659, formerly with Paramount, to bat for him locally during his absence. Alley's lectures will cover his newsreel experiences, climaxing with his Sino-Japanese war exploits, including his photographing of the Panay bombing.

"Professor" Russell


JACK RUSSELL, veteran member of Local 659, IATSE, is in charge of the Insert and Research Departments at Columbia studio, where duties vary from supplying details of a marriage ceremony in Mexico to photographing every type of unusual shot required for pictures. Board members of Local 659 are calling Russell "The Prof" because of his wide knowledge and we expect to publish a story on the work of Russell's department in the coming December issue of INTERNATIONAL PHOTOGRAPHER.

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PHOTOGRAPHY

Studio Clubs Joint Holiday Affair

Inter-Studio Club organization plans spectacular pre-holiday December event, with exhibits, salons, lectures as follow-up to successful inaugural exhibition; club notes by Haines.

A SPECTACULAR pre-holiday affair is being lined up for early in December by the recently organized Inter-Studio Camera Club, which brings together the various individual studio photographic clubs into an organization for mutual benefit and exchange with the cooperation of INTERNATIONAL PHOTOGRAPHER, and the professional photographers, both motion picture and still, who are members of Local 659, IATSE.

This second general affair will feature a holiday salon, special technical exhibits, lectures and demonstrations by experts and a complete display and demonstration of the new fall lines of cameras and equipment by the important manufacturing firms. Final plans for the program will be mapped out at a meeting early this month of studio club officials and will be published in detail in the December issue of INTERNATIONAL PHOTOGRAPHER.

The Inter-Studio organization is chairmaned by Ted Krise, of Warners, with George M. Haines, member of Local 37, IATSE, and a contributing editor of INTERNATIONAL PHOTOGRAPHER, as secretary.

Sponsors of the Inter-Studio organization are officers of the following clubs: Columbia: Paul Murphy, president; Howard Edgar, secretary; Walt Disney: William Garriety, president; Janet Martin, secretary; Douglas Aircraft: Elmer Wheaton, representative; Paramount: Douglas Rudd, chairman; Virginia Printzlau, secretary; 20th-Fox: Ralph Townsend, president; George M. Haines, secretary; United Artists: Harry Sundby, president; John Wentworth, secretary; Warners: Ted Krise, president; J. L. Edwards, secretary.

Studio Club Notes

By George M. Haines

Following its successful initial joint program in September, the club last month staged a field trip to Whites Point, Palos Verdes, and similar special events will be staged in between the regular general sessions as the club program develops.

The 20th-Fox Club is to be congratulated on its president, Ralph Townsend. The interest and consistent efforts that he has put forth has made the club what it is today.

Warner Bros. Club, under Ted Krise, is showing marked progress and in its recent

club salon was shown the results of enterprising efforts by the members.

Paramount Club, under Douglas Rudd, is

Research Insures Accuracy

Small production, "Duke of West Point," is typical example of authentic presentation of scenes well known to millions of film fans.

By William Wallace, Local 659, IATSE.

Typical of the way modern production organizations handle the problem of presenting on the screen scenes well known to millions of Americans is the careful research and checking for accuracy practiced by the Edward Small organization in making "The Duke of West Point," for United Artists release.

Producer Small, before starting the picture, determined that it would have to be accurate in every respect. With this in mind, George Bruce, author of the original screenplay, spent several weeks at West Point and at the Royal Military College at Kingston, Ontario, before he started the actual task of writing. When the script was finished, he made another trip East and conferred with Academy officials to make sure that every little detail was in order.

Finally, when the cast, including Louis Hayward, Joan Fontaine, Tom Brown, Richard Carlson and Alan Curtis had been selected and the picture assigned to Alfred E. Green for direction, numerous other technical advisors were employed.

Lieutenant Walter K. Tuller, Jr., son of a famous Los Angeles attorney and a former West Pointer, was engaged as general technical advisor. He was present during the shooting of every foot of film for the production and had to approve of each little detail of wardrobe, set dressing, Academy etiquette and the like, before the cameras were permitted to turn.

When it came time to film the ice hockey sequences, Producer Small hired Arnold Eddy, graduate manager at the University of Southern California and ice hockey coach at that school, as technical advisor. Eddy personally supervised each of the hockey sequences after he had spent two weeks drilling his teams of players for the game as outlined in Bruce's script.

taking advantage of the many fine prizes offered throughout the country by submitting prints. Judging by the quality of their work Paramount club members should be returned winners in many cases.

Paul Murphy, of the Columbia Club, at last month's meeting brought out the most efficient way of obtaining members, namely that of requesting each member to bring in one member at the next meeting—and as a result the club since has shown a nice growth.

United Artists, under Harry Sundby, is just starting a club and by the first of the year it is expected to be fully in its stride. Photography fans at United Artists should get behind Sundby and make the club an organization representative of the U. A. lot.

When it came to the football sequences, Pasadena's famous Rose Bowl was made over to resemble Michie Stadium at West Point and the male members of the cast donned football uniforms and played, while Joan Fontaine sat in the stands and cheered. Again demanding realism in his picture, Small engaged the famous "Dutch" Wilcox to pass on the grid play recorded by the cameras. In the rugby scenes, Major Alanson Bekins, a one-time English star, presided as technical advisor and for the boxing sequences, wherein Hayward and Curtis attempt to settle their differences with gloves, Hank Moslon, now a collegiate boxing coach, was engaged for a similar task.

"Because it runs such a close parallel to real life," explains Producer Small, "'The Duke of West Point' presented many problems not ordinarily encountered in making a motion picture film. After all, it is very easy for people who are well acquainted with certain things, such as life in West Point, boxing, playing ice hockey, football or rugby to quickly notice some error on the screen. This would naturally turn them into critics of the rest of the picture and they would be looking for more boners, instead of enjoying the production as a vehicle of entertainment."

Photographically, "The Duke of West Point" is a remarkable motion picture, in that every nook and cranny on West Point's famous reservation has been duplicated on the sets designed at the studio, hence it was simple to switch from the background shots made at West Point direct to the sets constructed in Hollywood.

If anything, an improvement can be noted, since the benefits of modern studio lighting brings the many West Point replicas their full artistic representation from a photographic standpoint.



This series of still pictures by William Wallace, member of Local 659, IATSE, for the Edward Small production, "The Duke of West Point," illustrates the industry's accurate research to obtain authentic picturization of familiar scenes as described in the accompany-

ing story by Wallace. Also effective is the manner in which the stills indicate important story action. Much effort was devoted to insuring authentic atmosphere in the West Point and sports event sequences.

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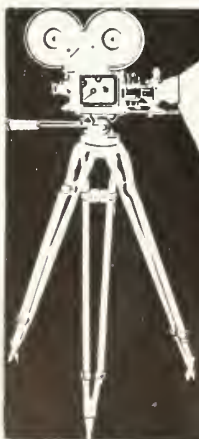
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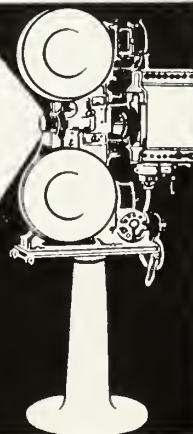
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New Kodak Building

New six story addition to Rochester camera works to meet new demand for products.

THE EASTMAN Kodak Company started construction last month of a six-story addition to the group of buildings comprising its camera works in Rochester. New building will measure 175 by 312 feet in area and is expected to be ready for occupancy in a year. The camera works, adjoining the general offices of the company, is the second-largest Eastman plant in Rochester.

Plans for the new camera works building have been under consideration for a year, according to Eastman officials, because "new types of photographic apparatus manufactured by the company and meeting a popular demand have imposed a need for more extended facilities in the manufacturing departments of the camera works and in the camera works engineering department, which is responsible for the design of new photographic equipment."

Television Flash!

Paramount announces tie-up with Dumont Laboratories for television shows on film by January.

JUST AS WE GO to press comes an announcement from Paramount that it will be the first motion picture company to enter the television field—in an association with Dumont Laboratories, whose head, Allen B. Dumont, has been a pioneer in the cathode ray tube field.

Experimental broadcasts from Montclair, N. J., under a Federal Communications Commission are announced to start in January, with receiving sets to be made available to the public at the same time. The Dumont television system is said to have only a three megacycle wave band, permitting more channels than under other systems.

Paramount's statement indicates a lack of confidence in any early use of coaxial cable for network television, which admittedly would cost billions of dollars, through emphasizing the use of motion picture film for recording programs for distribution to individual stations.

Watch for full technical details of this development with illustrations in the December issue of INTERNATIONAL PHOTOGRAPHER.

TOP RANK

EASTMAN Super X won its top ranking on performance. The results obtained from its combination of speed, fine grain, and general photographic quality make it the world's first choice in negative materials.

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EASTMAN *SUPER X*
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LABORATORY

Retired Printer

Landers & Trissell have machine that printed D. W. Griffith's famous "Birth of a Nation."

CONTRASTING STRIKINGLY with the modern stream-lined equipment available for laboratory processing today, is a "retired" printer that decorates the headquarters of Landers & Trissell, Hollywood studio camera and equipment rentals organization. One of the industry's outstanding pictures, "The Birth of a Nation," was printed on the machine.

The outfit was designed by Sam Landers for experiments he was conducting when the Local 659 member was cameraman and lab superintendent for D. W. Griffith. Just before completion of the picture in 1920, the old Triangle lot lab burned down and Landers' printer was the only one available. It was impressed into service for the pic-

ture that made film history with the first \$2 show on Broadway.

Compare this venerable old piece of equipment with the modern equipment from Duplex, Art Reeves and Fried Camera Co., that have been pictured and described in several recent TRADEWIND sections of INTERNATIONAL PHOTOGRAPHER.

Dupe Coordination

Academy Research Council names sub-committee to work for standardization of lab procedure.

A NEW ACADEMY committee was organized last month to investigate possibilities for coordinating the production of duplicating master prints and negatives. The committee held its first meeting late in October.

Chairman is Gerald M. Best of Warner Brothers, and members are Lawrence A. Aicholtz, Fred Albin, Philip E. Brigandi, L. E. Clark, Alan Freedman, Franklin LaGrande, Michael Leshing, Charles Levin, A. M. Miller, J. M. Nickolaus, Gerald Rackett, George Seid, Sidney Solow, Joseph Spray, John Swain, Ray Wilkinson, and

Gordon S. Mitchell, Manager of the Council. Claude Parfrey of the Elstree Laboratories, London, England, and Randall Terraneau of the Humphries Laboratories in London will represent the British film industry on this Committee.

First work of the Committee will consist of coordinating and disseminating information on improved studio laboratory processes in connection with the making of prints and negatives for foreign release, to be subsequently followed with a program for the eventual standardization of domestic laboratory procedure in connection with the making of negatives and prints for the foreign field.

Exchange Benefit Dance

FILM EXCHANGE Employees Local B-61, IATSE, will stage a dance November 18, at the Diana Ball Room at Pico and Norton Streets, Los Angeles. The local is staging a Jitterburg Contest which will be judged by three judges from the Los Angeles Municipal Courts, for a Le Roy Prinz dance trophy, courtesy of the Paramount Studios. The contestants will be sponsored by the American Ball Room Association, under the direction of Doc Morris, the Association's secretary.

The affair is a benefit dance for the unemployed members of the local. Also a Waltz Contest will be held and the trophy will be given by the Universal Film Exchange. Music will be furnished by Stan Kenton and his orchestra.

GENERAL

SMPE's Fall Convention

Another interesting session by Society of Motion Picture Engineers; Dr. Kalmus of Technicolor and K. S. Gibson of Bureau of Standards win annual honors; abstracts of many papers given.

HIGHLIGHTED BY the honoring of Dr. Herbert T. Kalmus of Technicolor with the SMPE Progress Medal for outstanding business and technical achievement, and of K. S. Gibson of the Bureau of Standards of the Department of Commerce with the SMPE Journal Award for the most outstanding paper originally published in the SMPE Journal, the Society of Motion Picture Engineers held their fall convention this year in Detroit, Mich., October 31st to November 2nd, inclusive.

Sound recording, both film and disc, lighting problems of theatres and studios, 16 mm recording and reproduction, and miscellaneous applications of cinematography as well as papers on television and new equipment lent variety to the subjects presented and discussed by the engineers at the convention.

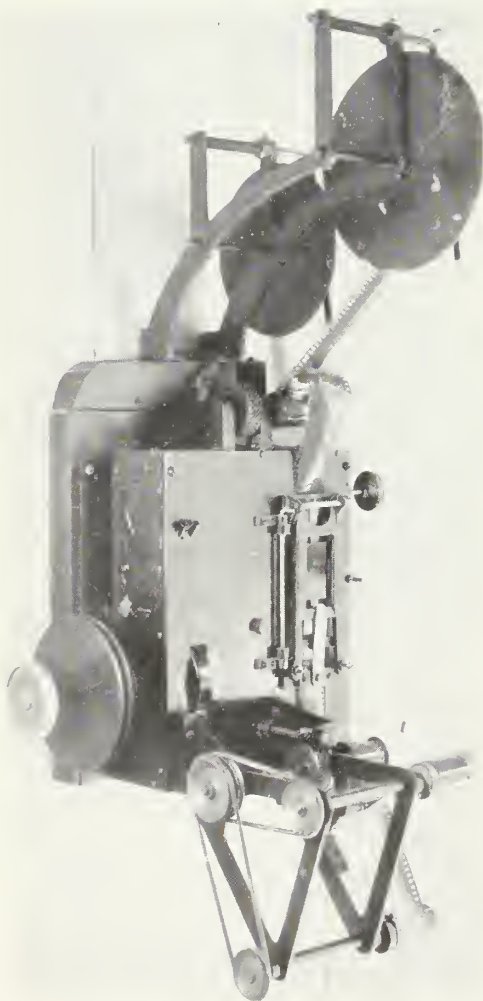
Dr. Kalmus delivered a paper that presented long-discussed progressive possibilities in color photography. He promised the

industry a new color negative three to four times faster than any now in use and also emphasized that the Technicolor-Eastman cross-licensing agreements are producing active and intense research by announcing that complicated color cameras soon would be scrapped for a single film color process, obviously referring to the long-awaited professional 35 mm use of Kodachrome.

Television and unusual astronomical and undersea photography also developed outstandingly interesting papers, described herewith, and followed by as many abstracts of other convention papers as were available by air mail up to the time of going to press.

Films and Television

Aspects of television that have counterparts in motion picture practice were discussed by G. L. Beers, E. W. Engstrom and I. G. Maloff, of the RCA laboratories. Comparisons of the techniques of both arts were presented as part of a general program of



This venerable printer, a far-cry from the modern streamlined machines described in several recent issues of International Photographer in the Tradewinds section, is installed in the headquarters of Landers & Trissell, studio rentals organization. It printed D. W. Griffith's "Birth of A Nation."

cooperation in which radio and movie engineers are keeping each other informed of new developments.

Relationship of the size of a television picture to the distance from which it will be viewed, and the number of "frames" or separate pictures per second necessary to produce best illusion of continuous motion to the eye were discussed. Other points covered were number of lines into which the television picture should be divided and method of interlacing lines for best results.

The paper also treated with the ability of a television system to convert the light reflected from objects of varying color into corresponding values of light shade. Problem is comparable to that of photography, in which objects in color are reproduced in varying tones of black. Another consideration was said to be characteristics of fluorescent screen of tube on which television picture is reproduced in home receiver, whose function is roughly comparable to silver emulsion used in photographic negatives and prints.

Among advantages expected from this program of mutual exchange of information between motion picture and television engineers is a more effective "matching" of one system with another, for transmission of motion picture films by television, and for possible future application of television devices to motion picture field.

I. J. Kaar, of General Electric, looked into the future at problems still to be solved before satisfactory television pictures will be available in the home on a national basis.

"Television differs from sound broadcasting in the importance of standards," Kaar said. "If transmission standards are changed, television receivers designed for old standards become useless. Because of this no responsible manufacturer would sell television receivers to the public until standards were fixed by the industry and sponsored by the Federal Communications Commission. The time is now opportune to bring television to the public, as research has reached a point where the picture image is acceptable to the public."

"The big problem ahead of television today," declared Kaar, "is: who shall pay for the television programs? In broadcasting, cost of programs is borne mainly by commercial sponsors. The public has been educated to expect a high degree of excellence in radio programs and it is doubtful whether mediocre program material in television would be acceptable. Just who is going to sponsor television broadcasts when a sizeable audience does not exist, is the big problem."

It is Kaar's opinion that "when television is born, it must be born full-fledged, as far as program is concerned. This, of course, means great expense which will have to be borne by the pioneers."

Questions of greatest interest to the public are, "How good is television?" and "How much will it cost?" Kaar said that the size of the picture is limited by the

size of the cathode ray receiving tube. A 12-inch tube is about the largest size practicable for use in a home cabinet. Such a tube will give a picture $7\frac{1}{2} \times 10$ inches. While this seems small compared with home movies, it will still have considerable entertainment value, because the audience will rarely view television at a distance of more than four feet from the screen. Kaar predicted interesting future developments in television tubes which will undoubtedly result in larger and brighter pictures, and that the coming years will bring great reduction in the costs of relaying programs in network hook-ups. Kaar concluded with "It's not to be construed that commercial television will await a solution to all these problems. Undoubtedly, television will be commercialized in the near future and the problems solved as time passes—much the same, for instance, as was the case in the motion picture industry."

Telephoto Mike

A new microphone which acts as a "telephoto lens for sound" was described by J. P. Livadary of Columbia Pictures and M. Rettinger of RCA Photophone laboratories in Hollywood. Device resembles a light naval gun, and contains scores of small pipes of varying length. Each of the pipes is "tuned" to a particular sound frequency. The individual sound pick-ups are combined and recorded all together.

In broadcasting, new device will enable engineers to get wanted sound at a distance, at the same time suppressing noises of local origin. For example, it can be used to pick up sound from various parts of an auditorium or outdoor stadium by focusing the telephoto microphone in desired direction. In the motion picture or radio broadcasting studio it enables use of a single microphone to collect sound from large orchestras or other sizeable groups of performers. Sound so gathered more closely approximates that received by a listener in an audience.

Unusual Photography

Problems of photographing planets and other celestial bodies millions of light years distant were contrasted with problem of underseas cinematography in two separate papers.

Professor R. R. McMath of McMath-Hulbert Observatory at the University of Michigan, described methods he uses to take motion pictures of solar bodies with a tower telescope and an apparatus he calls a "spectroheliokinematograph," which is now one of the most powerful pieces of solar observation equipment in the world. Taking motion pictures of planetary bodies in motion is adding a great deal to man's knowledge of the stars and contrasts with drawbacks

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of carrying on these researches through crude sketches and later through "still" photographs.

How man continues to conquer the obstacles of space, below the earth's surface as well as above it, was brought out in a paper by E. Fenimore Johnson. Johnson, son of the founder of the Victor Talking Machine Company which revolutionized home entertainment through development of the phonograph, told how he overcame physical as well as optical difficulties in designing methods and equipment for wresting some of the secrets of the water's depth through motion picture studies. Johnson carried on his researches from an 87-foot boat. He has taken thousands of feet of film, in the tropical waters off Dry Tortugas (about 65 miles from Key West) and in the Bahamas for the past three years. He illustrated his talk with a showing of some of his films.

F. J. Herman of Jam Handy Pictures, of Detroit, which is said to be the largest producers of industrial films in the world, envisaged a great future of steady growth for commercial pictures in this country.

Temperature of Color

It is commonplace for engineers to take the pulse of sound by measuring its frequency. Now they have found a way to take the temperature of color, according to E. M. Lowrey and K. S. Weaver, of the Eastman Kodak Company. Just as iron when heated changes in color from dark invisible infra red, through cherry red, to brilliant white, so the color values in the light of incandescent lamps change with the temperature of the filament of the lamps used in movie studios. Color pictures must provide the most accurate reproduction of actual scenes. Measuring the color temperature of lighting in color photography makes it possible to control color values both in photographing and projecting them. Otherwise serious distortion results.

"Some Practical Accessories for Motion Picture Recording"; R. O. Strock, Eastern Service Studios, Long Island City, N. Y.

Addition of practical operational accessories to standard recording channels as purchased expedites operation and saves time. At Eastern Service Studios a number of such accessories have been designed and are described briefly. Included in equipment are following items: small collapsible, portable microphone boom for location work; special microphone suspension to prevent mechanical noise from getting into recording system; small mixer console for stage work, to permit mixerman to operate close to scene of action; accurate illumination meter, using a microammeter, for setting and checking recording machine exposure; a compact re-recording mixer console equipped with equalizers, effect filters, amplifiers, and attenuators; a projected volume indicator and footage counter for use in re-recording rooms; a film play-back adapter for use on Western Electric film machine for location use; play-back horns for stage and location use; and an air-brush adaptation for looping re-recording tracks.

"Improving the Fidelity of Disk Records for Direct Playback"; H. J. Hasbrouck, Jr., RCA Manufacturing Co., Inc., Camden, N. J.

Recent advances in equipment design and in

materials of which recording disks are composed, have resulted in improved fidelity. Both volume range and frequency range have been extended, satisfying present-day requirements of motion picture and broadcast applications.

For reproduction, there is provided a new lighter weight lateral pick-up having high sensitivity and equipped with a permanent diamond point. This reproducer, in combination with its associated circuit, is suitable for use on all broadcast disk records.

Pre- and post-equalization are employed in the method described for making high-fidelity records, insuring an extremely low noise-level. This absence of background noise together with the wide frequency range and low overall distortion create an illusion of reality or "presence" during reproduction.

Usually a great many of playings are not required of direct playback disks. However, because of low mechanical impedance of the new RCA pick-up and improved composition of disks it is possible to reproduce 75 to 100 times without appreciable increase in noise or distortion. Great differences in record life under various conditions of handling have been noted and are attributed chiefly to accumulation of fingerprints and dust on record surface. Gradual oxidation of lacquer coating must also be considered and guarded against by special care when records of this type are intended for long preservation.

"Characteristics of Film-Reproducing Systems"; F. Durst and E. J. Shoett, International Projector Corp., New York, N. Y.

Analysis of sound-picture reproducing-system characteristics, including electrical and acoustical response data collected in interest of determining possibilities involved in obtaining an average characteristic for reproducing various film products with uniform response over several combinations of loud speaker equipment. With aid of a curve tracer having a long-persistent cathode-ray screen, a photographic record was made of the characteristics, starting with various forms and amounts of equalization and exploring their relationship to power-handling capacity of amplifiers. Following through system, this record shows characteristics of dividing networks under various conditions of load, and finally acoustical response curves taken for comparison of loud speaker equipments under study.

Measurements of loud speaker combination included various types of units, both permanent-magnet and energized, low-frequency horns ranging from open back baffles to folded horns with specially designed rear-loading compartment, and high-frequency multicellular horns of various configurations and constructional details.

After establishing natural characteristics of various equipments involved, careful listening tests were made over an extended period with samples of commercial prints and other recordings. A description is given of difficulties and problems involved in an effort to obtain one overall characteristic, which would give satisfactory reproduction for all types of material. The final results are shown, with a short discussion of the methods for duplication in other equipment combinations, and concluded with recommendation for future designs and ratings.

"Some Production Aspects of Binaural Recording for Sound Motion Pictures"; W. H. Offenhauser, Jr., New York, N. Y., and J. J. Israel, Brooklyn, N. Y.

Binaural sound recording for motion pictures has a long development history of worthy achievement, yet to date it has not found application in our everyday entertainment sound motion picture. Inspection of situation reveals that, like stereoscopic pictures, there is not complete acceptance of any of the various theories and that shades of interpretation are so many that it is difficult to secure a consensus on what constitutes binaural sound recording for motion pictures. Instances are cited to show that "theoretically perfect" sound is not necessarily the objective;

in fact, since it is the illusion produced, both by sound and picture that is in the final analysis important, "theoretically perfect" sound may even destroy the illusion we are trying to create.

History of binaural sound recording for motion pictures is reviewed and especial reference is made to early developments of Rosenberg and Kuechenmeister. A short review of developments since the work of these pioneers covers in a general way advance of the binaural sound motion picture recording art to date. Production requirements of binaural sound recording for motion pictures are analyzed briefly and importance of editing process in production of finished picture is outlined.

A new binaural sound motion picture production technic is suggested, based upon the developments of authors, that may be quite readily adapted to present-day production technic. It is pointed out that perspective sound control, which is an important added feature, does not affect shooting stage operations; this control is suggested as a logical part of dubbing-room operations. Some of effects produced include variation of apparent recording-room size from very small, says, 1000 cu. ft. to vary large, say, 500,000 cu. ft. Another important effect is simultaneous yet essentially independent movement of one sound-source with respect to another and the essentially independent left-right movement. All these effects are possible with no movement whatever of the sound-source or sources with respect to the microphones. Essentially same effects can be obtained with the pseudo-binaural system, a system in which it is possible to take a completed picture of the conventional monaural type and by a simple dubbing operation, provide practically all important binaural characteristics without any additional sound recording whatever.

"A Machine for Artificial Reverberation"; S. K. Wolf, Acoustic Consultants, Inc., New York, N. Y.

Sometimes there arises necessity of introducing into recorded sound a liveness that is not present in original sound-waves impinging upon microphones in recording studio. Reverberation chambers have been used to provide the additional liveness, but such chambers are not very flexible in use and are costly to install.

A new machine has been developed by means of which reverberation may be introduced into recorded sound artificially. Sound is recorded upon an endless magnetic sound-carrier or tape, which passes beneath a number of pick-ups or reproducers at intervals along carrier. These pick-ups are connected to a mixer panel, and sound level of each is adjusted to produce reverberant effect required. After passing last pick-up head in series, sound is "wiped off" magnetic carrier.

Such a machine finds many applications, and is useful not only in studios for direct recording, but also for adding liveness to records during process of dubbing.

"Latest Developments in Variable Area Processing"; A. C. Blaney, RCA Manufacturing Co., Inc., Hollywood, Calif., and G. M. Best, Warner Bros. Pictures, Inc., Hollywood, Calif.

This paper presents a series of curves showing the photographic control of variable area sound tracks as obtained in commercial production at Warners studio; and to show wide tolerances in film processing which are permissible with Class-A push-pull recording, a factor which is of especial interest in connection with the daily production. Results of a study of technique involved in fine grain photographic duplicating of variable area sound track, for foreign release is also discussed.

"Report of the Studio Lighting Committee"; C. W. Handley, Chairman.

In a previous report need of a catalogue of studio lighting equipment was emphasized. A number of papers have been published which describe various lamps and light sources in de-

tail, but there has not been assembled in one paper a symposium of all types of equipment and light sources. It is the intention of the committee to correlate published and unpublished data on motion picture studio light sources in such a form as to make this report a reference for complete information on the subject. The various lighting units are numbered and briefly described. Photographs of popular lamps are shown. Tables give minimum and maximum beam divergences, carbon and bulb sizes. Journal reference numbers are given as a key to further specific information on any lamp or illuminant. Data on light control devices and lamp filters is included.

"Evolution of Arc Broadside Lighting Equipment"; P. Mole, Mole-Richardson Co., Hollywood, Calif.

From earliest days of artificial lighting of motion picture sets broadside type of unit has been a fundamental lighting tool. Regardless of type of light-source used in such lamps—whether mercury-vapor tubes, carbon arcs, or incandescent filament globes—the broadside is a lamp of the floodlight type, designed to emit a relatively wide flood of soft, moderately powerful illumination. It has withstood innumerable sweeping changes in lighting and photographic technic, including introduction and acceptance of spotlighting, change from orthochromatic to panchromatic film materials, changes from silent to talking pictures and from arc to incandescent light-sources, and present growing popularity of natural-color photography.

This paper traces evolution of arc broadside only. It comments upon design and performance of early-day units, which were adapted almost intact from previous similar lamps used in photo-engraving. It follows evolution of broadside through successive improvements in silent-picture usages; through its decline at the introduction of sound and Mazda lighting; through relatively recent rebirth of arc lighting due to the requirements of modern natural-color photography; and most recently introduced units of this type which are replacing equipment designed less than five years ago at introduction of three-color Technicolor process. Comparison is made between early, intermediate, and modern units as regards color distribution, light distribution, steadiness and length of burning period, indicating that though less public attention has been given to these types than to more familiar spotlighting units, broadside has kept pace with advances in lighting and equipment design.

"Report of the Projection Practice Committee"; H. Rubin, Chairman.

This report deals with two major projects completed by the Committee within the past six months, namely, the third revision of the Projection Room Plans and the proposed revision of the NFPA "Regulations for Handling Nitrocellulose Motion Picture Film." These two projects are given in detail. Other projects now under consideration by the Committee are briefly mentioned.

"The Lighting of Theatre Interiors"; F. M. Paige, General Electric Company, Cleveland, Ohio.

Here and there a theatre is planned with lighting features utilizing fundamental principles that have been expounded on many occasions. In too many cases, however, interior lighting has lagged far behind exterior lighting for advertising, and owner and public alike have suffered. In too many cases, also, theatre falls far short of complementing attractive scenes so well projected upon the screen. This paper reiterates aims and advantages of proper lighting, and outlines the problem of locating, coloring, and controlling the lighting properly so that it will be comfortable and pleasing and an aid, psychologically. It discusses possibilities of systems of lighting such as downlighting and fluorescent lighting. New materials and new light-sources were demonstrated and discussed.

New equipment for brightness measurement also was shown as an aid in building up a quantitative background of what conditions conduce to comfort and satisfaction.

"The Stability of the Viscose Type of Ozaphane Photographic Film"; A. M. Sookne and C. G. Weber, National Bureau of Standards, Washington, D. C.

Viscose Ozaphane, a new type of film with a base of regenerated cellulose sheeting, and having certain advantages for record use, was tested to determine its comparative stability. Its stability was compared with that of cellulose nitrate, and also with that of cellulose acetate which is widely used for filmstrips, and which has been found to be a very stable material for preserving records in libraries. The viscose type of film apparently is not suitable for permanent records, but does appear to have properties to recommend its use for reading-room copies that can be replaced when they become unserviceable. The stability was determined by measuring changes in its chemical and physical properties under accelerated aging. The changes observed were increase in acidity and copper number, and decrease in viscosity, weight and flexibility.

"The Evaluation of Motion Picture Films by Semimicro Testing"; J. E. Gibson, The National Archives, Washington, D. C., and C. G. Weber, National Bureau of Standards, Washington, D. C.

Test methods for evaluation of motion picture film for permanent records require test specimens too large to be removed from certain archival films. To assist those charged with the preservation of such films in determining the quality and checking the condition of them, suitable semimicro methods were developed for acidity, viscosity, and residual hypo content. Specimens as small as 7 mg. in weight, removed from the film with a small hand punch, gave satisfactory results for the purpose.

"New Sound Recording Equipment"; D. R. Canady and V. A. Welman, Canady Sound Appliance Co., Cleveland, Ohio.

Recorder for 16 mm. Film.—This recorder is characterized by its constancy of speed and its convenience and simplicity of operation. Constant-speed drum is not affected by temperature changes. Recorder has an aluminum magazine of 400-ft. capacity, with friction take-up and fitted for either galvanometer or glow-lamp recording, glow lamp being preferred because of its simplicity.

Noise-Reduction Unit for Glow-Lamp Recording.—A self-contained unit, either portable or for panel mounting, which provides polarizing voltage and noise reduction for glow-lamp recording. It has simple adjustments for setting the minimum and maximum current desired, and when these adjustments are set the unit is fully automatic. It is variable over a wide range and will give recordings from 5 to 25 ma. of current or from nearly clear negative to fully exposed negative. It has no time lag, can not react in any way with the amplifier, and may be connected to any amplifier.

Galvanometer for 35- or 16-mm. Recording.—An oil-damped galvanometer, so designed that each of its component parts is readily adjustable, making it possible to be fitted to almost any recorder. Galvanometer has straight-line output to 10,000 cycles.

Projector for Background Projection.—A claw projector, noiseless in operation and rock-steady, designed for extreme requirements of background projection. Claws have three teeth on each side; tension shoes are long, with adjustable tension, and wear on the film is minimum. Mechanical parts are enclosed and lubricated by oil pump from oil sump.

"A 16 mm. Studio Recorder"; R. W. Benfer, Electrical Research Products, Inc., New York, N. Y.

Recent advances in commercial use of 16 mm sound-film have stressed importance of improving

product. Certain limitations imposed by optical reduction process for obtaining 16 mm sound prints are eliminated by recording 16 mm negatives for contact printing. A studio recorder for this purpose is described. Paper deals briefly with results of considerable investigation to determine desirable recording characteristics and concluded with demonstration of experimental recordings.

"Independent Drive for Camera in the A-C. Interlock Motor System"; F. G. Albin, United Artists Studio Corp., Hollywood, Calif.

The "Selsyn" or alternating-current interlock motor system used to drive cameras, recording, re-recording, and projection machines in synchronism, is a popular type of motor system in large studios. It has special advantages in such applications as driving projector and camera for projection background process. The one inexpedient feature is that system is generally started from a central point such as the recording room, and the cameraman does not have means for running his camera independently as is so often required for photographing slates, exposure tests, and silent scenes.

An addition has been made to the a-c. interlock system to give it advantages possessed by the synchronous motor system: namely, facilities enabling cameraman to operate his camera at will at regular speed.

Addition consists of set of relays with control circuits, and a frequency changer and field exciter set. Normally, camera motors are connected to common interlock system through relays. If, however, button provided at the camera is depressed, pilot relay operates and energizes main relays which transfer camera motor circuit to bus of the frequency changer and field exciter set. Camera motor is operated as a true synchronous motor. One phase of the rotor is short-circuited, and remainder is excited with direct current and serves as field. The three-phase stator is supplied with three-phase power of a frequency that will cause motor to run at required speed, same speed as when driven with the interlock system.

Power developed by a-c. interlock camera motor when operated as a synchronous motor is approximately same as under normal operating conditions. Acceleration is typical of small synchronous motors when power supply is suddenly connected. The pull-in torque is superior to slotted-rotor type of as-synchronous motor. Operation of system is smooth, simple, and efficient, and has, after several years of use, proved its value.

"A Silent Wind Machine for the Production Stage"; F. G. Albin, United Artists Studio Corp., Hollywood, Calif.

Machines generally used on motion picture production set to create wind for pictorial effects are large motor-driven propeller fans mounted on floor stands. The noise level produced at high velocities is so high that satisfactory sound recording of the scene is practically impossible. Furthermore, size and shape of machines are such that they must be placed at distance that the directivity is not readily controllable. Additional hazard to sound recording of causing wind around microphone always exists, and commonly, the desirable microphone placement is sacrificed in order to avoid wind.

New type of wind machine has been adopted and used for several years with a great improvement realized. New type is centrifugal blower, such as is commonly used in ventilating systems. Air is conducted by means of light canvas ducts from exhaust of blower to set where scene is being enacted. Ducts are equipped with variously shaped fittings and nozzles so that air stream may be directed as desired.

It has been found expedient to locate blower outside stage building and enter duct through special portal. Thereby, greatest noise source, blower, is remotely located and insulated from scene by the walls of stage building. Furthermore, it incidentally serves as a ventilator, sup-

plying fresh air to scene. Measurements of noise level for various wind velocities indicate improvements up to 70 decibels in noise reduction. Thus sound recordings of scenes requiring wind are made possible where heretofore it was necessary to photograph the scene without sound and provide synchronized sound subsequently.

"The Metro-Goldwyn-Mayer Semi-Automatic Follow-Focus Device"; John Arnold, Metro-Goldwyn-Mayer Studios, Culver City, Calif.

During recent years an important problem in major-studio cinematography has been that of following focus. Due to shallow depth of field

in modern lenses when used at maximum apertures, it is necessary to alter focus frequently during filming of a scene to keep actors properly focused. In moving-camera shots, which are being used with increasing frequency, this problem is naturally aggravated, since both camera and players may move. Use of "blimped" cameras for sound pictures also aggravates cameraman's problems, as finder parallax is greatly increased by placing finder outside the camera bungalow.

At the MGM these problems have been simplified by the use of Semi-Automatic Follow-Focus

device. This consists of a finder which is both focused and pivoted to correct for parallax as the lens is focused. Individual cams coordinate finder movement with characteristics of any given lens.

So successful is this coordination that it is possible to determine whether or not an object is correctly focused in the camera by observing object's focus and position in finder. Device has been applied to all cameras used in production at the studio, and has over a period of several years proven to be accurate, dependable, and has facilitated production to a noteworthy degree.

TECHNICAL ARTICLES

PATENTS

LAST MONTH THE following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,128,710—MOTION PICTURE FILM END CLIP FOR REEL. *John Sydney MacDonald*, Highland Park, Mich. Application March 30, 1936. 3 Claims.

A clip for picture reels comprising a substantially U-shaped member provided with a pair of parallel slots in the bight thereof through which the film is adapted to be threaded, said member on the outer side of one of said slots being outwardly offset, each leg of said member having a reduced intermediate portion, and a yieldable sleeve engaging each leg about said reduced portion.

No. 2,128,773—ARRANGEMENT FOR TAKING MOTION PICTURES IN NATURAL COLORS. *Jean Marie Gutmann and Pierre Angenieux*, Paris, France. Application Feb. 7, 1935. In France Feb. 17, 1934. 2 Claims.

A method of taking motion pictures in natural colors which includes three objectives grouped to give three separate images in one normal picture space of a standard strip of film, each provided with an appropriate color filter, and having a number of prisms with totally—and semi-reflecting surfaces.

No. 2,128,921—PROCESSING PHOTOGRAPHIC SENSITIZED MATERIAL. *Rupert Draeger*, U.S.N. Application Dec. 24, 1935. 16 Claims.

A photographic strip processing device comprising a tank, an open ended cylinder within said tank, a plurality of radially extending vertical blades secured at the bottom of said open ended cylinder, and means for causing a current to flow vertically between said blades.

No. 2,129,060—PICTURE FILM COLOR CONTROLLING APPARATUS. *Karl Robert Hoyt*, North Hollywood, Calif., assignor to Telco Corp., a corporation of California. Application June 5, 1937, Serial No. 146,663. 5 Claims. (Cl. 51-78)

A color control apparatus for treatment of motion picture film strip having color coated emulsions on opposite faces, including polishing mechanisms in position at opposite sides of a

portion of the strip, platen means for moving the strip through the polishing means in the form of reversed bights with faces to relative polishing means, and manually controlled means for independently changing the speed of the polishing mechanisms at opposite sides of the strip irrespective of the speed of the strip.

No. 2,129,114—MULTIRANGE PHOTOELECTRIC EXPOSURE METER. *Albrecht Bernhard and Guido Beyrich*, Germany, assignors to Metrawatt Aktiengesellschaft Fabrik Elektrischer Messgerate, Nuremberg, Germany. Application Feb. 27, 1936. In Germany March 2, 1935. 9 Claims.

A photo-electric exposure meter having a means of varying the amount of electrical energy flowing to the meter, the energy varying means having a scale of stop values.

No. 2,129,205—MANUFACTURE OF LENTICULAR PRINTS. *John Eggert*, Leipzig-Gohlis, and *Gerd Heymer*, to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt-on-the-Main, Germany. Application Jan. 3, 1935. In Germany Jan. 9, 1934. 4 Claims.

A process of making lenticular prints which comprises exposing a lenticular film through a multi-color filter and lenses, and illuminating the original film through the embossed side.

No. 2,129,227—SOUND REPRODUCING APPARATUS. *Richard S. Morse*, Rochester, N. Y., assignor to Eastman Kodak Co., Rochester, N. Y. Application Oct. 14, 1936. 2 Claims.

A sound reproducing apparatus having a motion picture sound track illuminated by a source of light supplied by a high-frequency source of current, forming a high-frequency carrier wave and modulating it with the output of a photo-electric cell associated with the sound track, and then introducing the modulated high frequency output into a radio receiving set.

No. 2,129,898—MICROPHONE BOOM. *Arthur George Wright*, Los Angeles, Calif., assignor to Twentieth Century-Fox Film Corp. Application Oct. 2, 1936. 9 Claims.

In an extensible boom having a support intermediate its ends: a barrel; a rod slidably mounted in said barrel; a piston connected with said rod; a second barrel having an interconnecting passage to said first mentioned barrel; a piston in said second barrel; a weight attached to said piston; liquid connecting said pistons; and means for moving said piston and weight in said second barrel to move the piston and rod in said first mentioned barrel in an opposite direction.

No. 2,130,010—SOUND AND PICTURE REPRODUCING APPARATUS. *Robert Platt-Hepworth*, Paddington, near Sydney, Australia. Application Aug. 15, 1935. In Australia Aug. 30, 1934. 4 Claims.

A motion picture projector including a sound unit, a primary drive shaft, a housing receiving said shaft centrally thereof, a flywheel, cut-off shutter and pinion carried by said drive shaft, three gear wheels disposed about said pinion and in mesh therewith, a continuous film feed sprocket driven by the first of the three gear wheels, a sound wheel sprocket driven by the second gear wheel, an intermittent sprocket and take-up sprocket, said intermittent and take up sprocket being driven by the third gear wheel and said sprockets being located laterally of the plane of the drive shaft spindle.

No. REISSUE 20,867—METHOD OF MAKING COMPOSITE PICTURE. *Roy J. Pomeroy*, Los Angeles, Calif., assignor to Paramount Pictures, Inc. Original No. 1,715,510, dated June 4, 1929. Application Jan. 5, 1931. 12 Claims.

The method of producing a composite photograph embodying two component parts, that includes making a transparent image of one component, making a photographic silver deposit image of the other component surrounded by a clear ground, chemically transforming the silver deposit of said image and thereby producing an image of the second mentioned component substantially uniformly opaque to light but reflective of light to show its image details, superposing the two images and illuminating the first image by transmitted light and the second mentioned image by reflected light, and exposing a fresh actinic surface to the first image and the second image so illuminated and superposed.

No. 2,130,537—ARRANGEMENT FOR COPYING LENTICULAR FILMS. *Andre Dervieux*, Paris, France, assigned to Henry Lyme Walker, Paris, France. Application Feb. 6, 1936. In Great Britain Feb. 14, 1935. 3 Claims.

An arrangement for copying lenticular film having a source of light for illuminating the original film, said light being distributed over a wider angle than the angular aperture of the lenticular elements of the film to effect substantially uniform illumination of the exit pupil of each lenticular element, said source of light being in an arc exceeding 180° and being disposed approximately in the plane perpendicular to the said lenticular elements so that the strength of the rays over a considerable range is proportional to the obliquity of incidence on the film, a film gate for the original film, and an image-forming optical system for projecting the image on the copy film.

No. 2,130,541—ART OF MAKING MOTION PICTURE CARTOONS. *Max Fleischer*, New York. Application Dec. 14, 1936. 8 Claims.

The method of making motion picture cartoons which includes making a series of drawings of an animated foreground figure with a circum-

scribed outline substantially black upon a substantially white surface, photographically making transparent positives of said drawings on a strip of motion picture film with said outline on said positive substantially opaque and positioning said positive film in front of and in contact with a strip of unexposed motion picture film in a camera; superimposing a separate sheet of transparent material upon each of said series of drawings and rendering the portion of said sheet appearing within the outline of said drawing opaque to and reflective of light, successively positioning said transparent sheets in front of a background, and successively photographing said sheets and said background through successive of said positives upon said strip of unexposed film in the camera.

No. 2,130,704—SOUND PERMEABLE PICTURE PROJECTION SCREEN AND METHOD OF MAKING SAME. *Karl Patzwaldt*, Gladbach-Rhedyt, Germany. Application Dec. 16, 1936. In Germany Oct. 11, 1934. 5 Claims.

A material for sound picture screens composed of two layers of fabric, the fabric on the projection side being open mesh and the other fabric being close mesh, and having a coating of light-dispersive material on the open mesh fabric and around the bases of the open meshes on the close mesh screen.

No. 2,131,469—DRIVE MECHANISM FOR MOTION PICTURE PROJECTING MACHINES. *Ewald Boecking*, Brooklyn, N. Y., assignor to International Projector Corp., N. Y. Application Oct. 8, 1934. 2 Claims.

In mechanism for translating a film having a sound track, a drive shaft, a driven member, a plurality of leaf spring elements, means carried by said shaft for engaging the inner ends of said leaf spring elements, and means to lock said circular elements in given positions.

No. 2,131,501—SOUND RECORD PRINTING. *Glenn L. Dimmick*, Haddonfield, N. J., assignor to Radio Corp. of America. Application Jan. 19, 1935. 4 Claims.

The method of making a photographic print which includes passing light through a negative image,

forming a real image of said negative image in coincidence therewith, and exposing a photo-

graphic emulsion to the light from said real image transmitted by said negative.

PROJECTION

Symposium Plans

THE DISCUSSION of photo electric cells and associated circuits starting on Page 25 is the third of a series of up-to-the-minute technical articles on modern projection equipment arranged in symposium form by Paul R. Cramer, contributing editor of INTERNATIONAL PHOTOGRAPHER, with the cooperation of engineers of the leading manufacturing companies and the major studios.

Because of the great interest in these articles among projectionists and the comparatively limited circulation of this publication in the field in relation to the fullest possible benefits of the symposium, plans now are being discussed for the reprinting of the series for wider distribution and also its expansion for further coverage of new equipment from the standpoint of best maintenance and putting the finest show on the theatre screen.

INTERNATIONAL PHOTOGRAPHER and the RCA company have received so many queries about a typographical error in which several lines were transposed in the initial articles of the symposium in the September issue of INTERNATIONAL PHOTOGRAPHER. For the benefit of those who are saving the

series, the following correction notice is published:

In "Theatre Sound Optical Systems," appearing in the September issue, the top six (6) lines of the second column on Page 26 should appear at the top of the first column on this page. The last line in column one will then read into the seventh line in column two as: "There are several styles of filament in use at present . . ."

New ARC Test Reels

EFFECTIVE immediately, the Academy Research Council will have available both variable area and variable density Standard Multi-Frequency Test Reels for use in checking sound reproducing equipment. The Primary Standard Reels contain a complete set of frequencies and Secondary Standard Reels a lesser number.

Prints of either type reel contain appropriate sound titles announcing each frequency and each print is individually calibrated to a film used as a calibrating standard. A sheet listing these calibrations accompanies each print.

The Council announces that experience in making up these reels indicates that the meter fluctuation for any one frequency within one reel is less than $\frac{1}{4}$ lb.

Prices for the new test reels: Secondary Standard Reels, \$17.50 each; Primary Standard Reels, \$25.00 each. All prices f.o.b. Hollywood, Calif., and subject to a discount of 15% in lots of 10 or more ordered at one time.

STANDARD ELECTRICAL CHARACTERISTIC

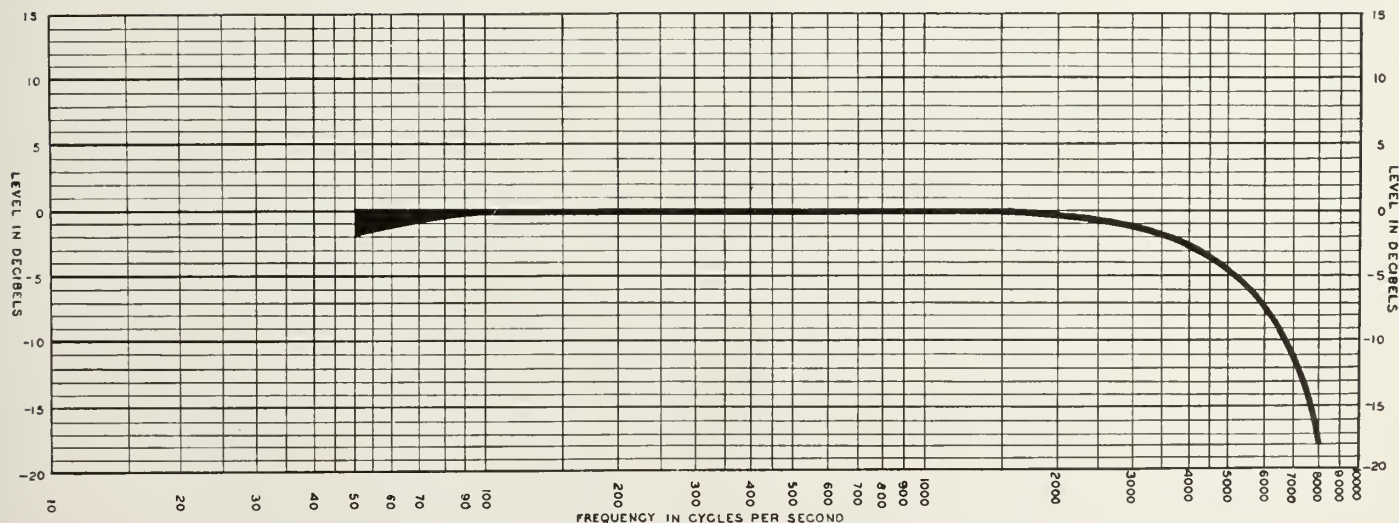
For Two-Way Reproducing Systems Using

Metal Diaphragm

Types I (M-101, M-1, M-2 Systems), II and III

OCTOBER 10, 1938

Electrical Run, Measured at the Output of the Power Amplifier with a Resistance Equivalent to the Speaker Load Using the Academy Research Council Standard Multi-Frequency Test Reel (Corrected), Altec Test Film (ED-20, Corrected), or RCA Test Film (Catalogue No. 26571)



For optimum results with current studio sound recordings, Type I, II, and III systems as listed above, equipped with metal diaphragm speakers, should be adjusted to this Revised Standard Electrical Characteristic.

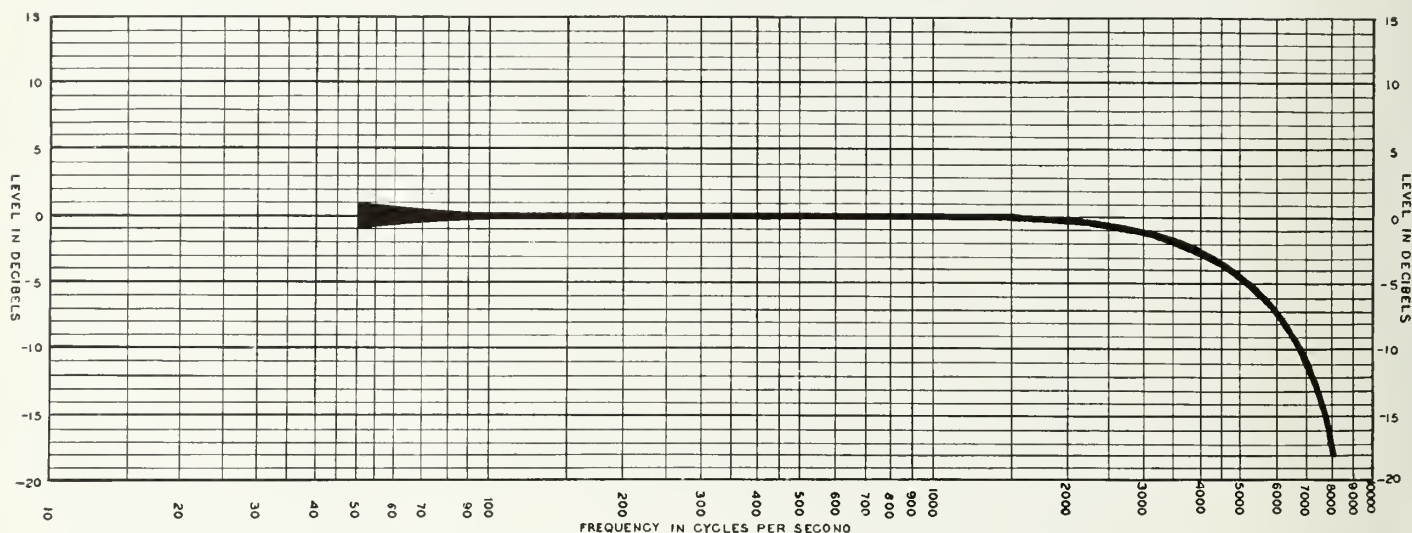
The tolerances of ± 1 db up to 3000 cycles, increasing progressively with frequency to a maximum of ± 2 db at 7000 cycles, should be rigidly maintained in adjusting equipment to these specifications.

Metal Diaphragm

Type I (M-3 Systems)

OCTOBER 10, 1938

Electrical Run, Measured at the Output of the Power Amplifier with a Resistance Equivalent to the Speaker Load Using the Academy Research Council Standard Multi-Frequency Test Reel (Corrected), Altec Test Film (ED-20, Corrected), or RCA Test Film (Catalogue No. 26571)



This characteristic for the above Type I equipments (M-3 Systems) has not been changed, and this Characteristic remains as specified in the original publication of March 31, 1937, and the subsequent publication of June 8, 1937.

The tolerances of ± 1 db up to 3000 cycles, increasing progressively with frequency to a maximum of ± 2 db at 7000 cycles, should be rigidly maintained in adjusting equipment to these specifications.

ARC Revisions

THE ACADEMY RESEARCH COUNCIL last month released revised Standard Electrical Characteristics for two-way reproducing systems in theatres, to supersede the original specifications of March 31, 1937, and subsequent specifications of June 8, 1937. The new revisions are the result of

further developments in reproducing equipment and follows extensive field tests conducted by the ARC's committee on standardization of theatre sound projection equipment.

As previously published the characteristics were all included in one curve (see Int. Photog. April, 1937; July, 1937), but the committee this time has made and released separate charts for the

curves applying to the various systems. These are published herewith. The ARC committee plans to add data on additional systems as progress is made.

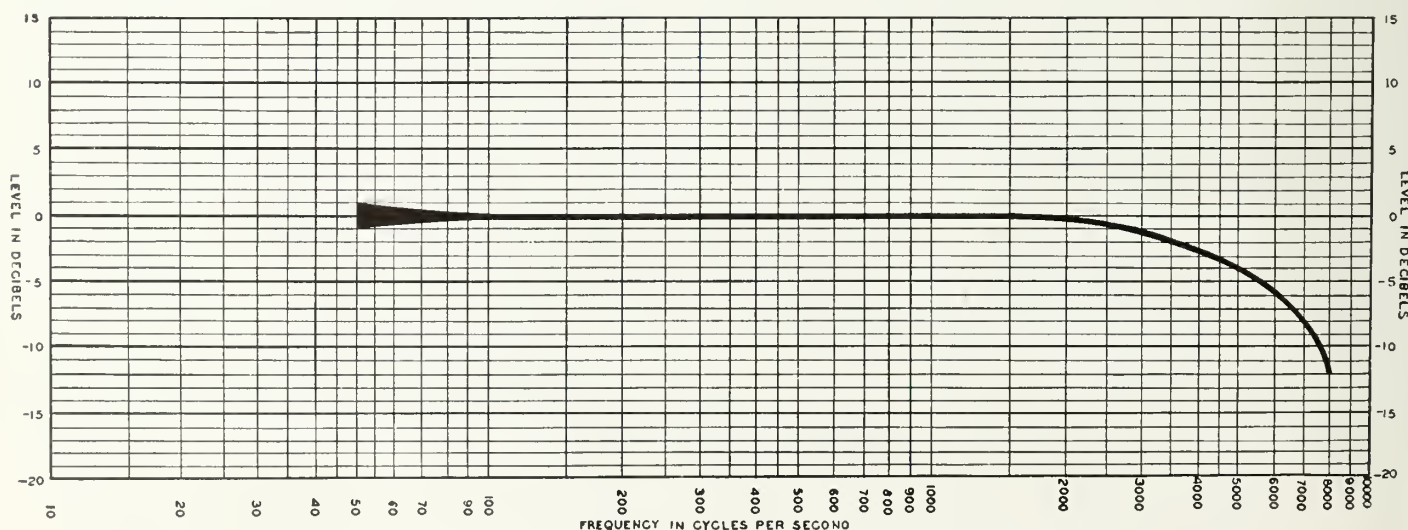
The revised Standard Electrical Characteristics as released cover the systems which are described by the captions accompanying the charts on this and adjoining pages.

Metal Diaphragm

Type I (M-4, M-5 Systems)

OCTOBER 10, 1938

Electrical Run, Measured at the Output of the Power Amplifier with a Resistance Equivalent to the Speaker Load Using the Academy Research Council Standard Multi-Frequency Test Reel (Corrected), Altec Test Film (ED-20, Corrected), or RCA Test Film (Catalogue No. 26571)



For optimum results with current studio sound recordings, Type I systems as indicated above, equipped with metal diaphragm speakers, should be adjusted to this Revised Standard Electrical Characteristic.

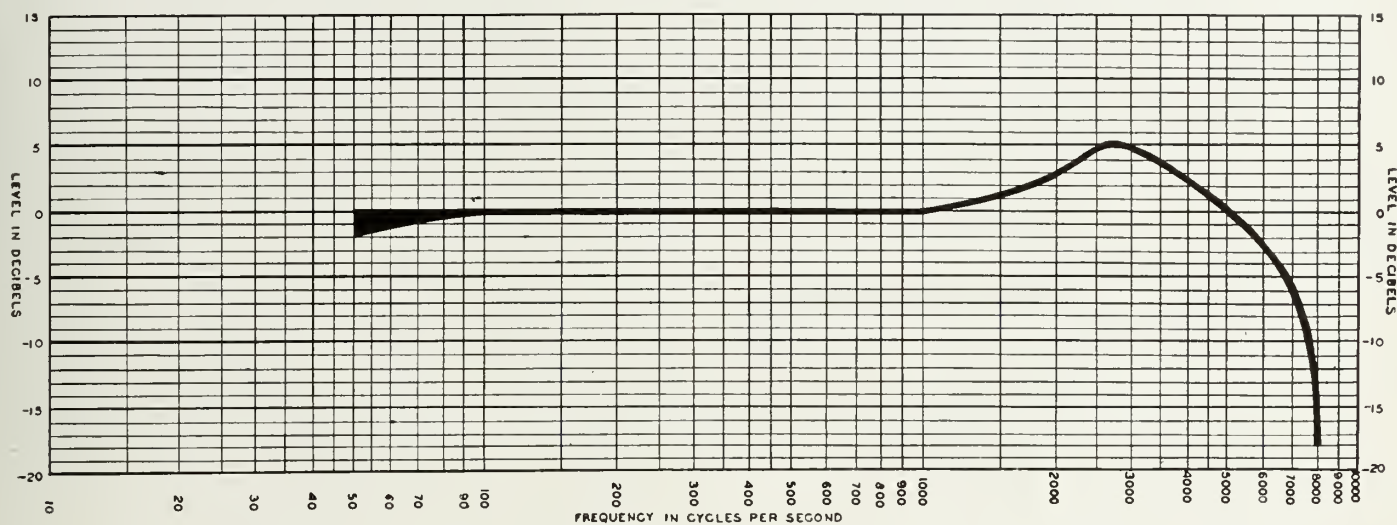
The tolerances of ± 1 db up to 3000 cycles, increasing progressively with frequency to a maximum of ± 2 db at 7000 cycles, should be rigidly maintained in adjusting equipment to these specifications.

RCA Non-Metallic Diaphragm

Type IV

OCTOBER 10, 1938

Electrical Run. Measured at the Output of the Power Amplifier with a Resistance Equivalent to the Speaker Load Using the Academy Research Council Standard Multi-Frequency Test Reel (Corrected), Altec Test Film (ED-20, Corrected), or RCA Test Film (Catalogue No. 26571)



For optimum results with current studio sound recordings, those two-way reproducing systems equipped with non-metallic diaphragm speakers (Type IV) should be adjusted to this Revised Standard Electrical Characteristic.

The tolerances of ± 1 db up to 3000 cycles, increasing progressively with frequency to a maximum of ± 2 db at 7000 cycles, should be rigidly maintained in adjusting equipment to these specifications.

Projection Symposium

Discussion of photoelectric cells and associated circuits from the projectionist's standpoint.

By W. S. Thompson, RCA, Hollywood.

(A) REVIEW OF ARTICLES 1 AND 2

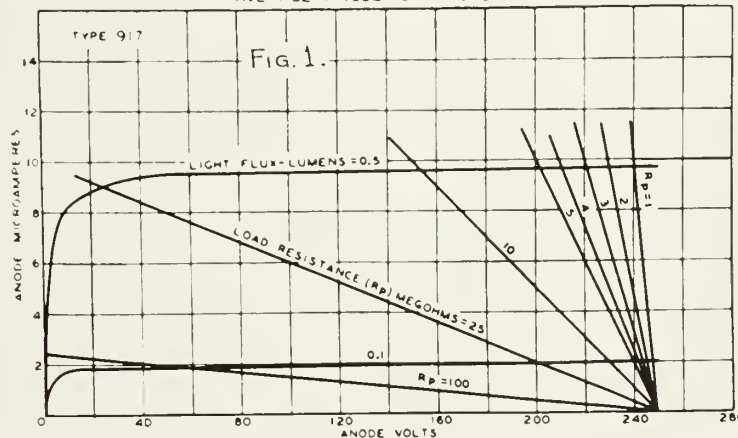
In Articles 1 and 2 of this series we have traced the development of the sound reproducer optical system, lamps, the film moving mechanism and film dimensions.

It is the general tendency of manufacturers today to make use of sealed tube optical systems of the imaged slit type, and to design film handling mechanisms that permit adherence to the SMPE standards for scanning dimensions.

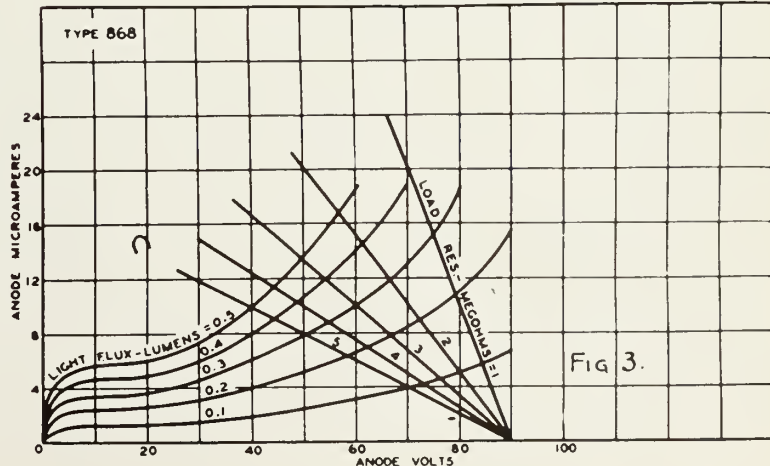
In many soundheads being manufactured today, all friction and sound gates over which the film was formerly passed have been eliminated and

rotating gates equipped with rotary stabilizers are used. This type of machine is exceptionally free running, easy to service and maintain and gives performance remarkably free from speed irregularities.

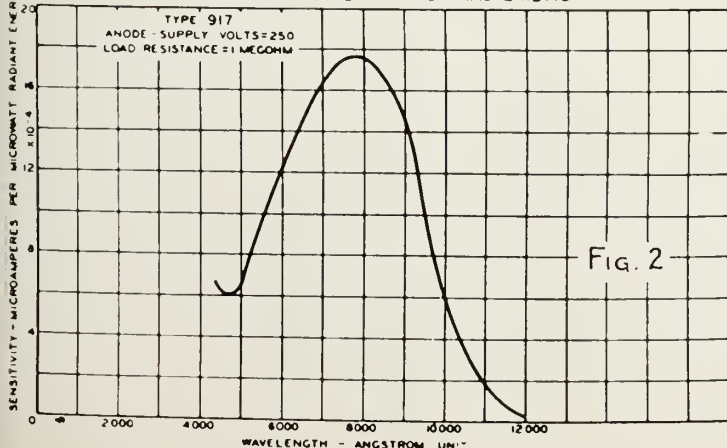
AVERAGE ANODE CHARACTERISTICS

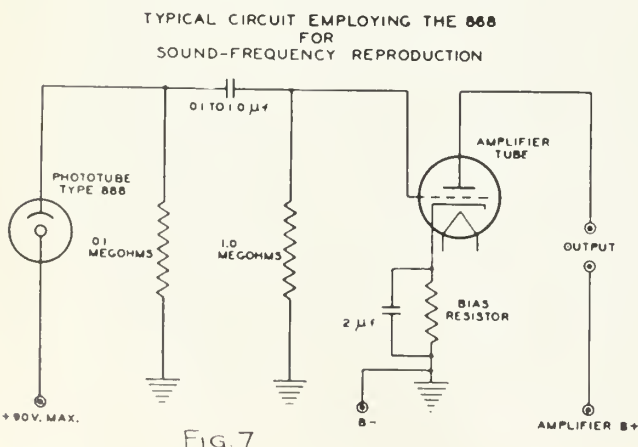
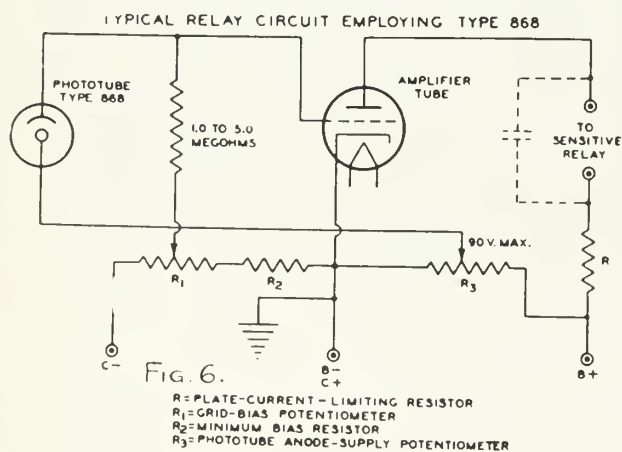
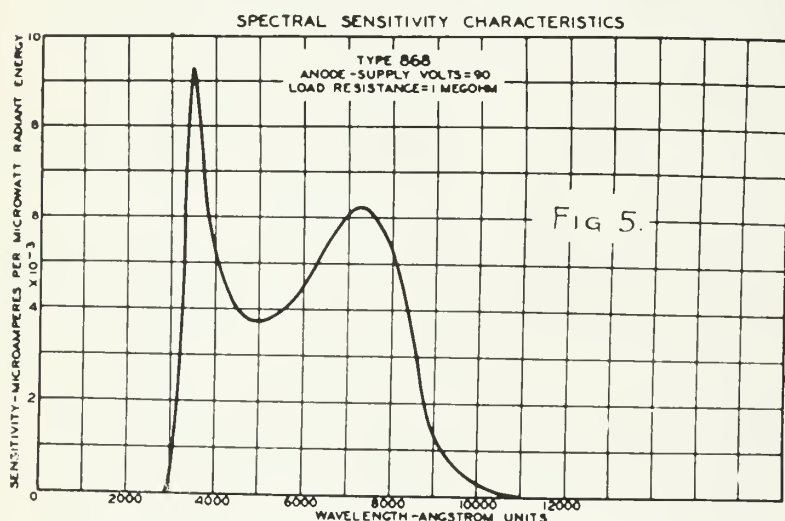
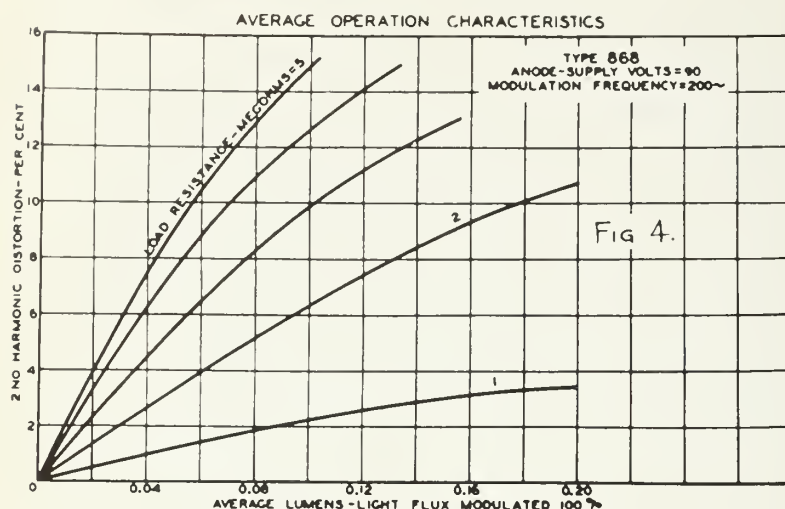


AVERAGE ANODE CHARACTERISTICS



SPECTRAL SENSITIVITY CHARACTERISTIC





(B) PHOTOELECTRIC CELL CHARACTERISTICS AND DUTIES

In the scientific world there is known a general class of devices which are sensitive to radiant energy in the form of electro-magnetic waves. Since in our discussion of radiant energy we are primarily interested in waves in the visible spectrum, we will use the term "light waves" from now on. Photoelectric cells are one class of these devices and are characterized by the fact that when the light waves fall on their active surfaces there is a voltage set up or a current flows or electrons are emitted.

In general, photoelectric cells may be classified into the following groups:

1. Photoconductive Cells.
2. Barrier Cells.
3. Photovoltaic Cells.
4. Photoemissive Cells.

(1) Photoconductive Cells

It was discovered many years ago that the metal selenium has the peculiar property of changing its resistance to the flow of electricity when its surface is exposed to light areas. Later on it was discovered that there were other metals which exhibited this same characteristic, the most important of which is thallium in the form of a sulphide.

There have been many attempts to use these two substances in the reproduction of sound, and in the case of selenium there was a time when some few hundred theatres were using selenium cells in the soundheads. The chief objections to the use of these cells are their instability and the fact that their output decreases with increase of audio frequency. This decrease is due to a lag in the action of the cell. As the audio frequencies on the sound film go higher and higher the light fluctuations are faster and faster, and hence due to the lag in the cell the resistance changes become less and less. In the commercial cell just mentioned the decrease in output was about 3 db per octave, hence the amplifier following had to be equalized by that amount.

(2) Barrier Cells

The well-known Weston photronic cell is an example of this type of cell. The general construction of a barrier cell is to have a metal base upon which the photosensitive material, such as selenium or cuprous-oxide, is formed and then covered by a translucent conducting film. This film is usually metal or graphite. Whenever light waves fall upon the sensitive material through the conducting film there is set up a voltage between the film and the metal base. The barrier cell has never become very important in the reproduction of sound due to a high inherent capacitance between the output terminals. This capacitance, of course, shunts any load impedance which might be used to couple the device to an amplifier and is of such a value that the load would have to be of the order of a few ohms before a satisfactory audio frequency response characteristic could be obtained. Such a low value of coupling impedance decreases the effective voltage to such an extent that the net sensitivity is too low for commercial sound use.

(3) Photovoltaic Cells

Even before the discovery of the photoelectric effect of selenium, it was found that voltaic cells could be made light sensitive by the proper choice of electrolytes and electrodes. Such a cell, in which the electrolyte is a solution of lead nitrate and the electrodes are cuprous-oxide and lead, has been put on the market at various times. When light waves fall on the cuprous-oxide electrode a voltage appears between the two electrodes.

This type of cell has operating characteristics not unlike the barrier cell, but is subject to instability, polarization, and a somewhat slower action. All of these effects have kept it from being used to any great extent in the sound reproducing field.

(4) Photoemissive Cells

This type of cell is by far the most important one in the sound field, and hence will be discussed more fully. It has been found that when certain electrodes are introduced into a vacuum or a partial vacuum cell, and light waves fall on the cathode, it will give off electrons which will in turn be picked up by the anode. The anode, of course, will pick up more of these free electrons if it is maintained at a positive potential with respect to the cathode.

The metals which have been found to be the most sensitive as the cathode are the alkali metals such as sodium, potassium, rubidium and cesium in the order of their mention. Later it was discovered that the oxides of certain metals were more sensitive, and that by special heat treatments even greater sensitivities could be obtained. One of the most sensitive cathode materials known at the present time is made by oxidizing a silver deposit and then exposing it to cesium vapor and finally giving it a heat treatment.

Since the performance of this type of photoelectric cell is greatly influenced by the degree of vacuum within the cell, we will classify the tubes for further discussion as Vacuum and Gas-Filled Tubes.

VACUUM CELLS. The sensitivity of a typical vacuum cell with change of anode voltage and light flux is shown in Fig. 1. It should be noted that in the vacuum cell, as long as sufficient anode voltage is maintained to keep the operating range above the shoulder of the curves, that the cell is perfectly linear with the light flux changes. As we will see later, this is not strictly true in the case of the gas-filled tube.

Fig. 2 shows the spectral sensitivity of this typical vacuum cell. The sensitivity peak lying at about 8000 angstrom units is of great benefit when it is being used with the ordinary incandescent light sources, since these lamps radiate a large part of their energy in this region.

GAS-FILLED TUBES. An inert gas, such as argon, is introduced into this type tube after it has been evacuated. The action of this gas is to increase the current flow from the cathode to the anode for certain anode voltages and light flux. As electrons are being drawn from the cathode to the anode they collide with the gas molecules and if the anode voltage is sufficiently high their velocity becomes so great that ionization of the gas takes place, hence amplifying the current flow. The amount of the amplification is limited by the ignition voltage or glow-point of the gas beyond which point the action is unstable and injurious to the tube.

Fig. 3 shows the sensitivity curves for a typical gas cell as compared to Fig. 1 of the vacuum cell. It should be noted that instead of flattening out at anode voltages above about thirty volts, the curves turn upward again, thereby giving greater sensitivity to the gas type cell. The micro-ampere per lumen sensitivity of this tube is about three times that of the previous vacuum cell.

Due to the non-linearity of the curves in Fig. 3, it becomes necessary to work the gas-filled cell into a lower impedance than that necessary for the vacuum cell if the tube is to be used in a sound reproducer. Fig. 4 shows how distortion may be introduced by too high a value of load impedance. For this reason good commercial soundheads use load resistance of less than $\frac{1}{4}$ megohm for light flux of about .05 lumens.

The spectral sensitivity of a typical gas-filled tube is shown in Fig. 5, and is seen to be very similar to that shown in Fig. 2 in the important red and infrared regions; that is, around 6000 to 8000 angstrom units.

(C) PHOTOELECTRIC CELL CIRCUITS

Two of the most common uses for the photoelectric cell are to operate a relay or for a sound reproduction in a theatre. Fig. 6 shows a conventional method of connecting a gas-filled photocell for the operation of a relay, and Fig. 7 for soundhead use. For these uses the gas-filled type is recommended due to its higher sensitivity for nominal values of anode voltage.

Another application of the gas-filled cell is in a push-pull soundhead, two circuits for which are shown by Fig. 8. The use of the coupling transformer shown in this figure enables the cell to be coupled to the first amplifier tube by means of a low impedance link circuit. This low impedance line from the soundhead results in very low noise pickup.

Whenever photocells are to be used for measurement purposes, the use of a vacuum type is recommended due to its greater linearity and stability at high anode voltages. The decreased sensitivity of the vacuum cell in terms of microamperes per lumen can often be compensated for by using high loading resistance and higher anode voltages.

A simple circuit for use in checking illustrations is shown in Fig. 9. For the solid line connection, the amount of current in the 43 tube will be at its greatest value for maximum light on the cell, while it will be greatest for minimum light on the cell for the dotted line connection.

An AC operated circuit for the measurement of illumination ratios is shown in Fig. 10. The two cells are illuminated from two different sources, the ratio of which is desired. One photocell charges the condenser C1 in one direction, and the other cell charges it in the opposite direction. If the two sources of illumination are equal, the net voltage across the condenser C1 is zero, but if one cell gets more light there will be a definite voltage built up across this condenser, which in turn is amplified by the 6C6 and the 43 type tubes. The output of the 43 type tube may be calibrated in terms of the ratio of illumination of the two sources. (NOTE: In all the circuits shown using vacuum cells, the grid circuit resistors in the first amplifier tubes are higher than recommended for these tubes. In order to keep the effect of the grid-cathode resistance of the amplifier tubes from affecting the measurements, the heaters of these tubes are all operated at less than rated voltage.)

In commercial soundheads the design engineers have had to face four general problems in coupling photoelectric cells to the amplifier circuits, viz.: output level of the cell, frequency characteristic, linearity, and noise pickup. To get the highest output level we would naturally use a high impedance circuit for the cell, but such a load would lead to distortion and a poor frequency characteristic. The engineers then use as high a load resistance as is possible consistent with low distortion and good high frequency response.

The matter of avoiding the pickup of extraneous noises in the coupling circuit has been the subject of much thought which has brought about three different solutions. One of these was to make the line from the cell to the first amplifier tube very short by locating a head amplifier right on the projector. Another solution was to lower the impedance of the coupling circuit to such an extent that a low capacitance shielded line could be run from the soundhead to the amplifier without pickup troubles. The solution that RCA is using now and has used in the past is to provide in the soundhead a transformer to couple the photoelectric cell to a low impedance (250 ohms) shielded line which run from the soundhead to the output transformer of the amplifier. The introduction of these two transformers to form the 250 ohm link circuit seems to RCA engineers to provide the greatest factor of safety possible.

TYPICAL CIRCUIT FOR THE 920 WITH EITHER TRANSFORMER OR RESISTANCE COUPLING FOR SOUND-ON-FILM REPRODUCTION

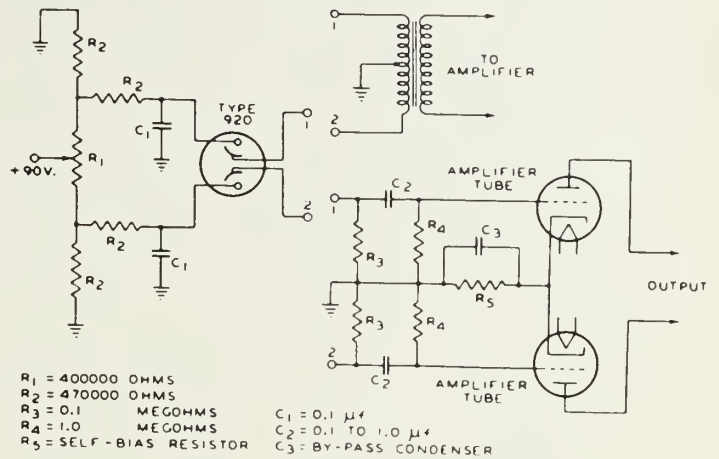


FIG. 8.

SIMPLE CIRCUIT FOR RELAY OR MEASUREMENT OPERATIONS

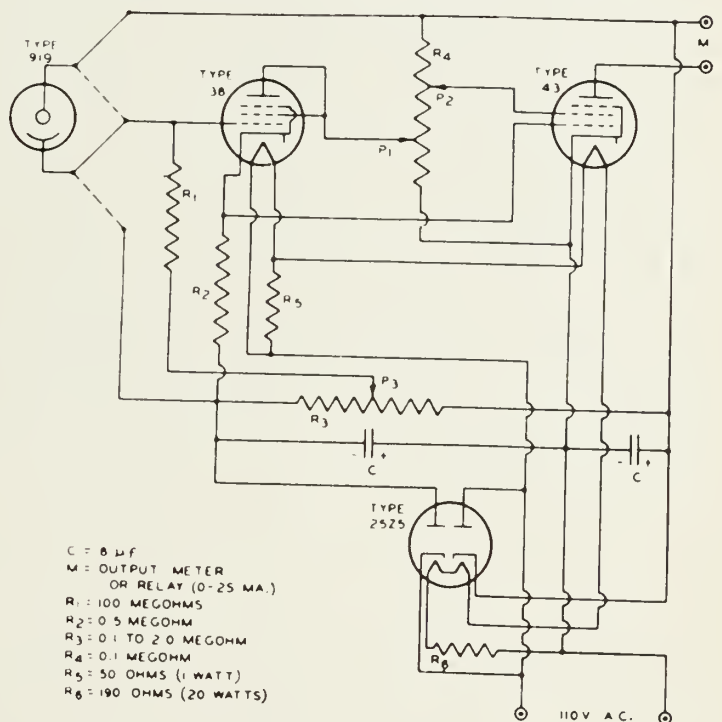


FIG. 9.

CIRCUIT FOR MEASUREMENT OF ILLUMINATION RATIOS

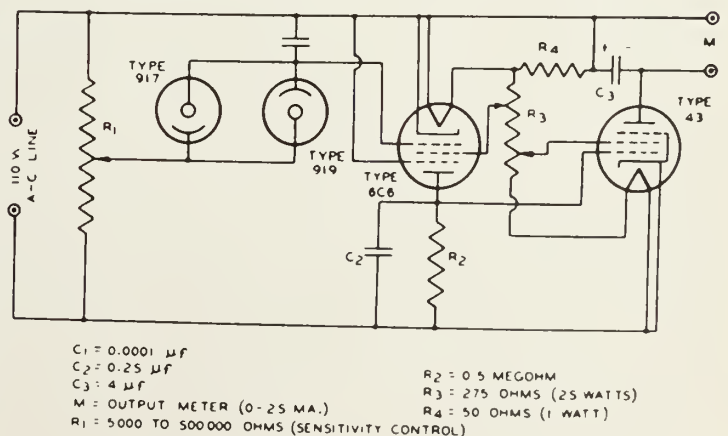


FIG. 10.

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Top Left, Agfa's De Luxe darkroom outfit, (Page 2, Column 2); Top Right, Bausch & Lomb's modernistic rectangular sports glass, (Page 4, Column 2); Lower Left, General Electric's new small-size foil-filled Photoflash bulb, (Page 2, Column 2); Lower Right,

Bausch & Lomb's new book-style slide case, shown with their new Slide Viewer; case when closed simulates a fine book, (Page 4, Column 2). Please turn to next page for start of news of new products.

New Twin Arc Broad Introduced by Bardwell & McAlister, Inc.

A NEW TWIN Arc Broad has just been introduced by Bardwell & McAlister, Inc., Hollywood lighting equipment manufacturers. This twin arc lamp combines two fundamental principles of operation which have been considered good studio practice for years, namely, a constant motor drive and a solenoid strike.

The mechanism consists primarily of an upper and lower carbon carrier mounted on slide rods and fed together by a screw which is driven by a motor. Mounted on the upper carbon carrier and moving with it on the feed screw is a striking solenoid employing a pair of clutches to bring the carbons to a predetermined gap for burning. This gives a quick striking feature which is necessary for light effects. During a burn, the clutches and solenoid remain "tight," the carbons being fed together by the motor. The light is very steady and of constant color, inasmuch as the carbons are constantly fed together at their rate of burn and there is none of the transient variations in the gap, which are known to be one of the causes of arc flicker and color change.

This predetermined gap and the amperage in the arc circuit have been set to Technicolor specifications for photographic white light.

The lamp is acoustically treated, reducing its noise level to a point far below normal recording level. The motor has a special acoustical mounting designed to filter its characteristic frequency. Twentieth Century-Fox, having purchased a number of these lamps, found them exceptionally quiet for such pictures as "The Little Princess," starring Shirley Temple; "Jesse James," and "Kentucky," three of the outstanding Technicolor pictures of the year.

In the lamp's construction, the reflector is of special optical design to give greater efficiency from a twin source. The glass diffuser is standard size for studio use. It is made of two-inch strips of factor-lite glass, which design brings heat breakage to a minimum.

Two pointers with time scales on the side of the lamp, one for each carbon holder, show the operator at all times just how much burn he has left in the lamp. When either carbon holder has reached the limit of its travel, a switch automatically cuts off the motor, thus not endangering the lamp from over-burning.

When used as a Scoop, the grid can be quickly attached to the head, permitting the lamp to be hung as one unit. As a Broad, with the grid on the Stand, the head is cooler, lighter weight, and much easier to handle. The light center height is normally 4 ft. 4 in. With Stand extended, this is 7 ft. 2 in.

DeLuxe Complete Darkroom Outfit Addition to Agfa Line

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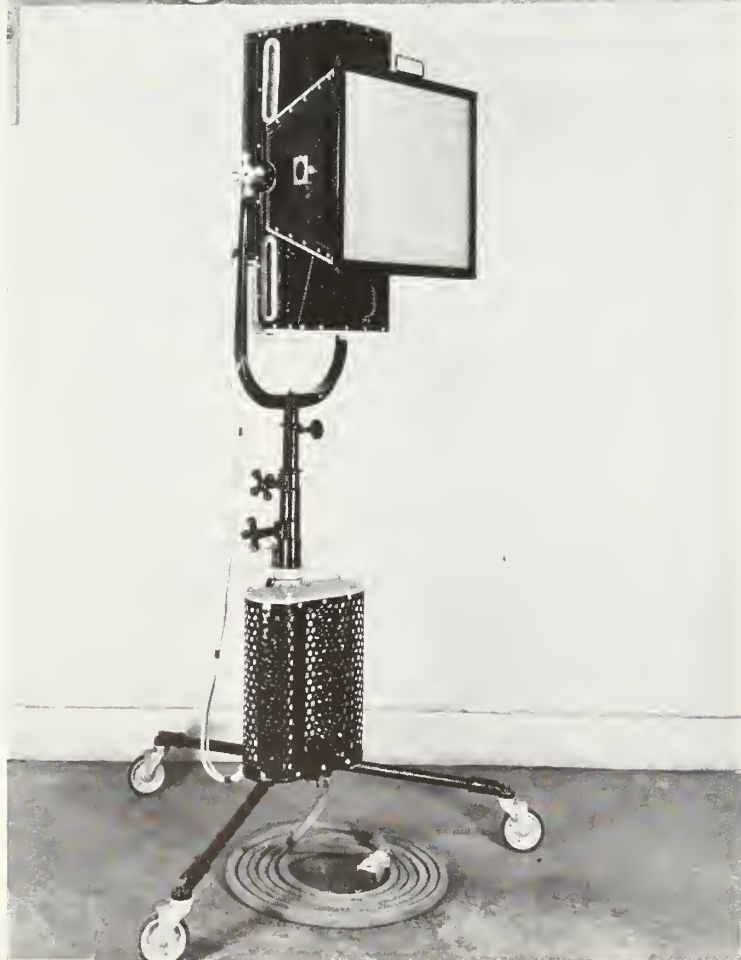
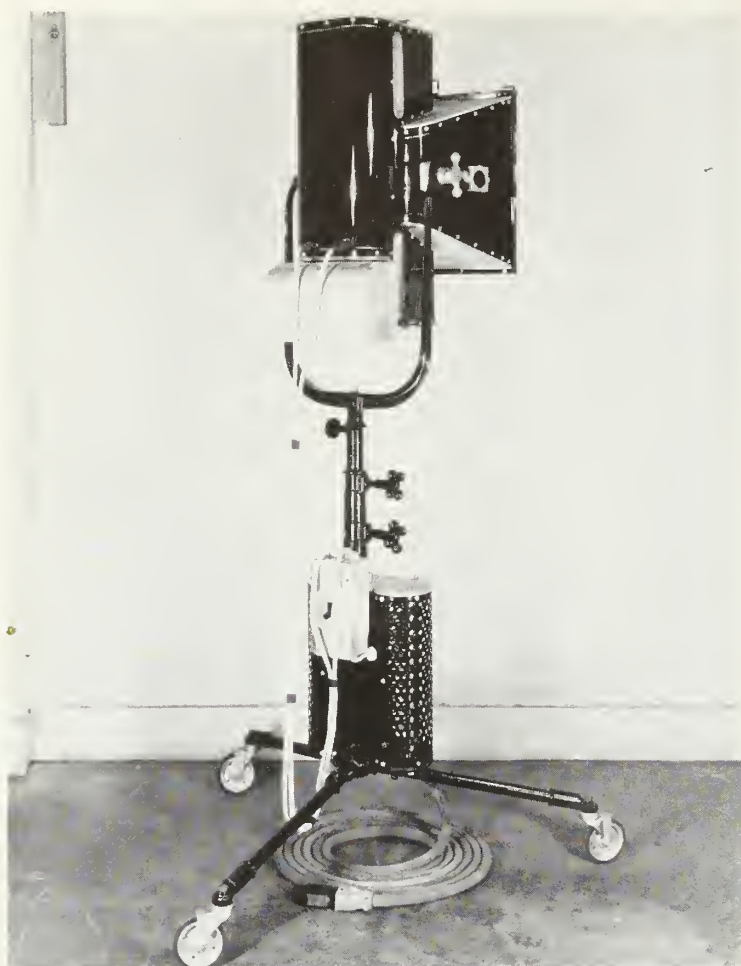
New Smaller Foil-filled Photoflash from General Electric; Other Prices Cut

A NEW all-foil-filled "news" Photoflash lamp—relatively small in size but high in effective light output—is announced by the Incandescent Lamp Department of General Electric Company at Nela Park, Cleveland.

Flash characteristics of the new G-E Mazda Photoflash Lamp No. 21 are such as to permit sure and easy synchronization. Small as a standard 60-watt Mazda lamp, the "21" permits users to conveniently carry more of these bulbs in the pocket than does the present larger No. 20 photoflash lamp. Despite its relatively small size, the new No. 21 emits a flash rated at 50,000 to 60,000 lumen seconds as contrasted to the 45,000 lumen-second flash of the larger No. 20 Mazda Photoflash Lamp.

The new flash bulb is said to provide sufficient light to permit the taking of satisfactory pictures at distances up to 15 feet from subject when used with fast panchromatic film, with camera shutter set at 1/200th of a second, and lens set at f:11.

When used with the new high-speed super-type film and the same camera settings, the new ash bulb provides sufficient illumination for taking pictures up to 30 feet from the subject. A single No. 21 is sufficient for taking good pictures at distances up to 25 feet from subject even when used with a box camera (lens at f:11) and with the new super-



Close-ups of Bardwell & McAlister's Twin Arc Broad.

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On the Cover: The spiritual significance of the holiday season is captured effectively in this rich still of a church interior, photographed by Harry Osborn, member of Local 659, IATSE, for the Columbia production, "Let Us Live."

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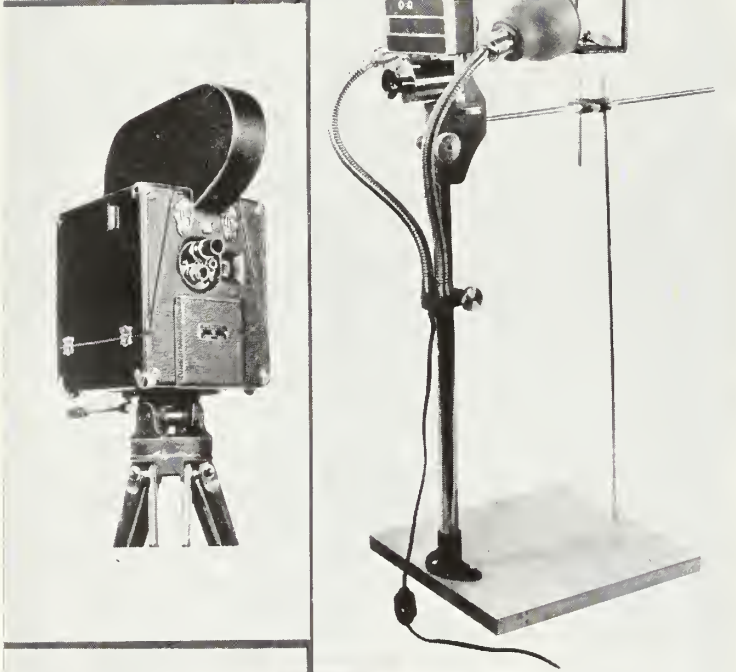
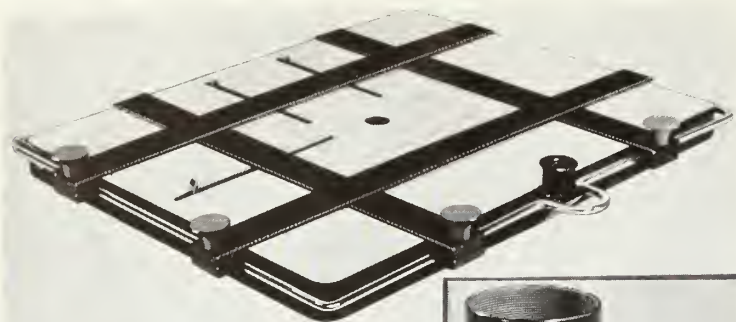
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speed "pan" film. The new G-E Mazda Photoflash Lamp No. 21 lists at 20 cents.

Also a 20 per cent reduction in the list prices of three Mazda Photoflood Lamps and a substantial reduction in the list price of Mazda Photoflash Lamp No. 20, effective December 1, were announced last month.

Photoflood lamps affected are: No. 1, reduced from 25c to 20c; No. 2, reduced from 50c to 40c; and No. 4, reduced from a list price of \$2.00 to \$1.60. The No. 20 Photoflash Lamp is reduced from a list price of 25c to 22c.

New Vest Pocket Sport Glass of Compact Design with Wide Field from B&L

A VEST POCKET sport glass, of compact flat design, is announced by Bausch & Lomb Optical Co. for use at all outdoor sports or at the opera. The new glass is of three-power and rectangular in shape, designed to afford an exceptionally wide view rather than a high one. This makes it particularly suitable for all sports, since the width of the field is 452 feet at 1000 yards. The black moulded plastic body in a modern design is $2\frac{1}{4}$ inches thick when closed and weighs but six ounces. It comes in a leather zipper case, in buff, blue, green or black and is priced at \$19.50.

New Slide Library Simulates Leather Volume for Library or Bookshelf

A MINIATURE Slide Library case simulating Florentine hand-tooled leather is now being offered by Bausch & Lomb Optical Co. in either red, green or blue. Resembling a fine old volume, this slide library is suited to grace the library table or bookshelf. It carries 100 slides in arranged cubicles and is indexed on the inside cover. Measurements are: $6\frac{1}{2} \times 10 \times 2\frac{1}{4}$, a handy size for the photographer to carry when displaying slides. The new B&L Slide Viewer is also compactly built and may be easily carried.

Victor Announces Price Cuts and Two New Sound-on-Film Models

VICTOR ANIMATOGRAPH Corporation, Davenport, Iowa, last month announced substantial price reductions on 16 mm silent projectors. Model 11 Master Projector, formerly listing at \$148 complete with case, is now priced at \$125 with case included. If 750 watt lamp and fast f:1.6 lens are desired in place of the 500 watt lamp and f:1.85 lens supplied as standard equipment, the price is \$132.

The Victor Model 22 (1600 foot film capacity) has been reduced from \$187.50 to \$175. This is a "blimp" model which is enclosed in case during operation. Standard equipment includes 750 watt lamp and two-inch f:1.85 lens.

The company also has two new models of the Sound-on-Film Animatophone now in production. A \$275 model with five watt output for operation on D.C. or A.C. is known as Model 31. A 14 watt output model known as the Victor 36 is to be supplied in three variations at \$345, \$365, and \$370.

Continuous 16 mm Projector Has Advance Feed Principle

A NEW 16 MM portable Continuous Projector, which is being placed on the market in both silent and sound models by Victor Animatograph Corporation, Davenport, Iowa, embodies a patented "advance-feed" principle which insures trouble-free performance, and protection against film destruction. "Bugaboo" of continuous projection always has been eventual tightening up of, and the loss of freedom in the film windings in the film magazine or around the film driving rollers.

In the Victor continuous model, the film is wound loosely around two large wheels which are driven synchronously by an endless belt, which also acts as a conveyor for the film. The film literally hangs from the upper wheel, which actually carries the film instead of drawing it along. Size and revolving speed of these wheels have been so calculated that the film is fed off slightly faster than it can be taken up by the intermittent. Slack in the film is automatically controlled by alternate starting and stopping of the drive wheel.

A film-slack lever, consisting of an arm and roller, rests on the strand of film which is being fed to the intermittent. Excessive slack in the film permits this lever to descend to a point where it automatically disengages the drive member. No more film issues from the magazine until the excess slack is taken up by the intermittent. This in turn raises the slack lever, re-engages the drive member, and the magazine again feeds out film.

Usability of the film is greatly increased by a tremendous reduction

Top, Argus' new critical focusing enlarging easel, (Page 6, Column 2), and the three new 16 mm lenses announced by Bell & Howell this month (Page 6, Column 2) Center Left, the Los Angeles made Syncro-Sound 16 mm motion picture camera, which Ampco will distribute nationally (Page 7, Column 1); Center Right, the new Argus all purpose copying bench (Page 7, Column 2); Bottom, Argus Model EFS photo-electric automatic speed printer for $2\frac{3}{4} \times 4\frac{1}{4}$ standard printers (Page 7, Column 2).

in surface rub or friction between layers of film. Added protection against film damage is provided by the Victor automatic film trips which automatically stop projection and film movement in event film loops are lost because of damaged perforations, incorrect threading, or defective splicing. Should spliced ends of the film, for any reason, come apart, film motivation is also automatically stopped, only delay in operation being time required to make a new splice.

The picture is projected onto the surface of an enlarging prism, which in turn projects at right angles to a rear projection screen. This screen is brought into position for use in much the same manner as the lens and bellows of a folding kodak.

Choice of 500 watt, 750 watt, and 1000 watt projection lamps insures screen brilliancy of the desired intensity, and a sharp, well-defined image even in broad daylight.

Craig Projector Editor Gives Home Movie Editors Studio Technique

EDITING OF home movies while viewing them on a screen, in the same manner as Hollywood professionals, can be done with a new and revolutionary type viewer, the Craig Projecto-Editor. Through a new principle in design, the Projecto-Editor permits the editing of motion pictures projected on a screen $2\frac{1}{4} \times 3\frac{1}{4}$ inches.

Outstanding feature of the Projecto-Editor is brilliant projection of the film without any flicker. In selecting the scene to be cut, film may be pulled back and forth by hand, with constant motion at any speed, and yet there is a picture on the screen at all times. This is made possible by the fact that the device has no shutter and no intermittent movement. Advantage of this is obvious; since when editing a film, the slow motion action can be studied carefully until the exact frame for cutting is selected.

In operation, the film is inserted over a gate and a sprocket and is pulled through by means of the rewinds. When the scene to be cut is framed, it is marked for cutting by means of a grease pencil. Short pieces of film from one foot up may be edited by hand and the action studied.

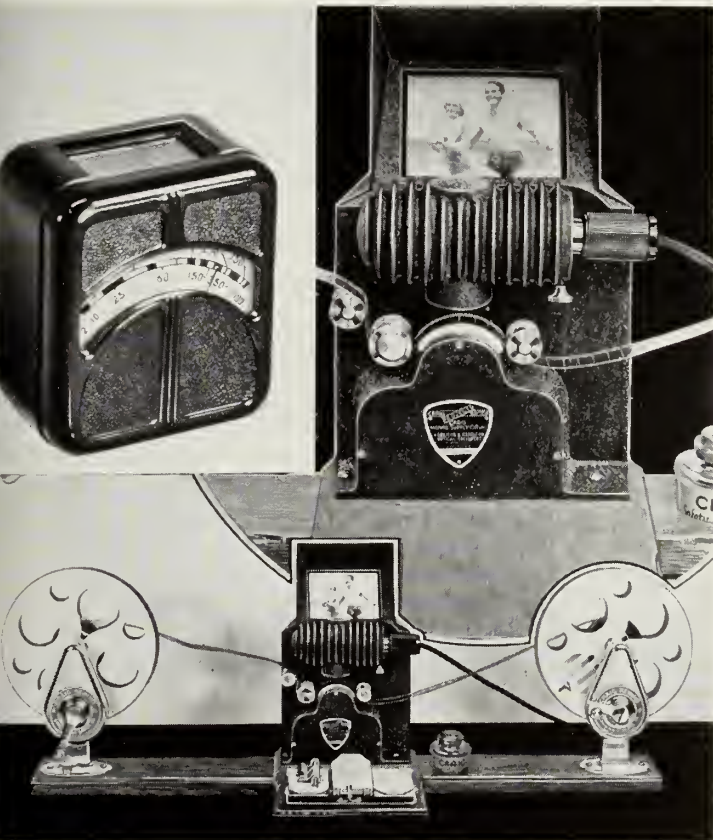
For convenience in editing and splicing, the Projecto-Editor is assembled on a 26 inch board with the Craig 16 mm Senior Splicer and Rewind Combination. Retail price is \$49.50 complete.

Filmo Turret Eight 134-K Is Super Camera Engineering Achievement

A TRULY sensational Filmo 134-K super eight camera is Bell & Howell's latest engineering achievement, with rotating three-lens turret, telescopic viewfinders, critical focuser, multiple speeds and other features. Like



The new Filmo Turret Eight (Page 5, Column 1).



Craig's professional style editor for home movies (Page 5, Column 1); and Inset, Argus' Photar exposure meter (Page 7, Column 2).

the Filmo 70-D, its photographic big brother, the new eight is equipped with a rotating turret upon which three lenses may be mounted. Any lens is placed in photographing position in an instant by rotating the turret, which has an easy but sure position change mechanism, and the proper view-finder moves into place at the same time. The Turret Eight takes the $12\frac{1}{2}$ mm 1" and $1\frac{1}{2}$ " lenses. This setup offers the utmost in selectivity: long range, middle distance or great lens speed.

The 134-K uses the new projected area telescopic view-finder, which made a hit on the new Filmo 141 a few months ago. Mounted on the turret adjacent to each lens is the corresponding view-finder objective; and as the turret is rotated to place the selected lens in position, the view-piece. Once the optics are mounted on the turret, it is impossible to use finder is also moved to the turret position in front of the view-finder eye-the wrong view-finder. Further, each view-finder presents a full size image; and there is no masking to cut down the size of field.

A rubber cup at the eye-piece excludes extraneous light and is a boon to persons wearing glasses. The view-finder is of the type known as "positive"; which means that no matter how the eye moves about the eye-piece, limits of the outlined field remain fixed in precisely correct position.

The standard lens is the Taylor-Hobson $12\frac{1}{2}$ mm f:2.5 Mytal, a lens familiar to users of the Streamline Eight. A full line of lenses is available, including 1" and $1\frac{1}{2}$ " telephotos, speed lenses, etc.

The Turret Eight also brings visual focusing to the 8 mm camera, for an improved critical focuser is built into the 134-K. By simply swinging the lens around in front of it and looking through the lens, while turning the focusing ring, the entire field is visible for pin-sharp definition. After the lens is focused, the turret is rotated to place the lens back in front of the film, and you are ready to shoot, confident of sharp focus. No more guess work!

The Turret Eight is available in two speed ranges of four speeds each—8, 16, 24 and 32 frames per second, or 16, 32, 48 and 64 f.p.s. The starting mechanism is a lever which starts and stops the camera smoothly and with no jar. Push it upward and you expose a single frame, for animation work. Push it down, and the camera gives sustained action.

The Turret Eight is equipped with the same automatic footage dial

that has been so successful on the Streamline Eight. Every time the camera door is closed upon reloading, the dial snaps back to zero.

The 134-K is housed in the light, sturdy, die-cast aluminum case that characterizes all Bell & Howell cameras. It is streamlined, as in some previous Filmo Eights, and the usual reliable exposure calculator is built in.

The case for the Turret Eight is compact, yet of amazing capacity. It will hold the camera with three lenses (up to 1½-inches in focal length) in place, a Weston meter of any model, two extra rolls of film, extra lenses, and filters. An easily accessible, dust-proof compartment in the cover holds the filters. The case is of genuine brown cowhide, and a shoulder strap is included.

B&H Offers New Type Continuous Projector Attachment

THE STRANGE-LOOKING object illustrated on Page 7 is a modern approach to "perpetual motion"—the new 800-foot continuous attachment of unique design announced by Bell & Howell for use with Filmo and Filmosound Projectors. It is shown mounted on a Filmosound Model 138. This new continuous attachment has been developed not only to provide greater "show" capacity than has previously been available in such a mechanism, but to incorporate features which add very appreciably to the life of the film used.

To eliminate friction between the film layers the attachment is mounted in a horizontal position so that the edge of the film bears the film weight. Design is such that the convolutions of film are caused to spread apart from one another, making the film run loosely in the attachment. In addition to reducing friction between the layers and decreasing the tension on the film at the sprockets, looseness of the film on the reel provides means for taking up variations in the overall length of the film due to shrinkage and to varying degrees of humidity.

If the film should become either torn at the perforations, or broken anywhere throughout its length, the projector is instantly stopped by the automatic protective switch supplied with the attachment. To further increase film life a substantial cover has been provided to enclose the reel entirely excepting for openings necessary for the film to feed in or out. The possibility of film scratching due to dirt and grit in the air is thus minimized.

The new B&H 800-foot Continuous Attachment is for use with 16 mm films, either sound or silent. Eight hundred feet of sound film, at 24 frames per second, provides a 22-minute showing; silent film at 16 frames per second provides a 33-minute showing, before repeating. Showings of these extra lengths are very much desired by those exhibiting at fairs, conventions, etc.

The continuous attachment is now supplied for Filmo silent projector Models 57 and 129, and for Filmosound Models 120, 138 and 142 with the exception of the variable resistance models.

General Electric Drops Prices on Eight Still and Movie Projection Lamps

SUBSTANTIAL reductions in the list prices of eight high-efficiency lamps designed for still and motion picture projection, effective December 1, 1938, were announced last month by the Incandescent Lamp Department of General Electric Company.

The projection lamps affected by the price reduction range from 300 to 1000 watts. Full details are available at retail outlets.

Complete Line of Insurance Protection on Cameras, Etc., from La Sance

JOSEPH H. LA SANCE, well-known to studio technical workers as proprietor of the Paramount Golf Range on the site of the present CBS Radio Center in Hollywood, has developed a complete line of insurance protection for cameras, projection machines, films, accessories and portable sound equipment. Upon expiration of his lease La Sance returned to the insurance business in which he had been an executive for many years, and is particularly specializing in technical equipment insurance. All insurance handled by La Sance is in long-established stock companies.

Daylight Type Professional Kodachrome Now Available Up to 8x10

PROFESSIONAL KODACHROME Film is now available in a type accurately balanced for daylight use in a number of popular sizes up to and including 8x10 inches. Identical in faithfulness of color reproduction with Professional Kodachrome Film, Type B, recently announced for studio use, the new Professional Daylight Type, extends advantages of Kodachrome in large sizes to the professional and commercial photographer who wishes to make direct color photographs out-of-doors.

Sizes in which Professional Kodachrome Film, Daylight Type, is now available are: 2¼x3¾ inches, 6.5x9 cm., 9x12 cm., 3¼x4¼ inches, 4x5 inches, 5x7 inches and 8x10 inches.

It can be used in ordinary cut film holders and can, therefore, be used in any camera accepting such holders. Any good anastigmat lens properly corrected for transverse and axial chromatic aberration (any

lens which gives critically sharp definition everywhere in the field for panchromatic film) may be used satisfactorily.

When Professional Kodachrome Film, Daylight Type, is used in sunlight or light of equivalent color-temperature, no filter is required. For this film, a Weston rating of 5 is recommended. Average exposure in sunlight for an average subject is 1/25 second at f:6.3.

While color balance of Professional Kodachrome Film, Daylight Type, is adjusted to produce correct rendering with average noon sunlight, without a filter, certain filters may be employed to compensate for variations in daylight color with different conditions of weather or subject, when such need arises, in open shade, the sky then providing the chief illumination, at a color temperature higher than that of the direct sunlight.

Filters which may be required under various daylight conditions are:

SITUATION	WRATTEN FILTER FOR SUNLIGHT EFFECT
1. Subject in open shade, very blue sky, no clouds.....	2A
2. Subject in open shade, blue sky, white clouds.....	2A or 1
3. Subject in open shade, light blue sky, white clouds.....	1
4. Subject illuminated by hazy sky.....	1 or none
5. Under overcast sky (varies considerably in color).....	1 or none
6. Subject illuminated by direct sunlight.....	None

Professional Daylight Type has moderate contrast and fair latitude, permitting some tolerance in exposure and normal contrast in the lighting of the subject. However, exposure must be more carefully calculated than with the black-and-white films commonly used, and lighting contrasts must not be extreme.

Color saturation and contrast of full-color transparencies made on Professional Kodachrome Film are such that satisfactory three-color prints can usually be made from them without employing masking methods. These transparencies are especially suitable as originals from which color-separation negatives can be made for the preparation of color prints on paper by the methods commonly used, and for photomechanical reproduction.

The new film is packaged in boxes each containing six films. Also included in each box is a return envelope, to be used when fewer than three films are returned for processing at one time; extra sheets of black paper for packing between exposed films, an instruction booklet, and a gummed address label.

All films must be returned to Rochester for processing. When three or more films are returned at one time, there is no processing charge; when fewer than three films are returned at one time, a 50-cent service charge is made. The processed transparencies are returned to the photographer in protective sleeves of clear Kodapak, which are removed only when the transparency is used for making separation negatives.

Agfa Ansco Cuts Prices on Many Films Effective December 1

AGFA ANSCO announces new lower prices, effective December 1, 1938, which apply to most sizes of Superpan Press roll film, Superpan and Superpan Press film packs, 35 mm Ultra-Speed Pan miniature-camera film, and 35 mm Infra-Red miniature-camera film. All Agfa panchromatic roll films, film packs and 35 mm miniature-camera films now sell for the same amount in each size. Details of the new price schedule are available at all retail outlets.

New Lines of 16 mm and 8 mm Lenses for Special Purposes from B&H

BELL & HOWELL announces that the recently introduced Extol f:1.5 is but the forerunner of a complete line of new 16 mm special purpose lenses now ready for the trade under the names "Extol," "Acura" and "Lumax." The new lenses are described as offering a high degree of color correction and producing fine, sharp pictures on color film as well as black-and-white. The list of new lenses announced as now available as optional equipment for Bell & Howell 16 mm cameras includes the following: 15 mm f:2.8 Acura in focusing mount, one-inch f:1.5 Extol in focusing mount, one-inch f:1.9 Lumax in focusing mount, two-inch f:2.8 Acura in focusing mount, three-inch f:2.8 Acura in focusing mount, four-inch f:2.8 Acura in focusing mount.

Two lenses trade-named "Anpax" and "Telate" for Filmo 8 mm cameras are also announced in the new line: 12½ mm (½-inch) f:2.5 Anpax in focusing mount, and the 1½-inch f:3.5 Telate in focusing mount.

Spectip on B&H Filmo 141 Aids Photographers Wearing Glasses

SPECTACLE-WEARING picture makers are accorded protective recognition in basic design of a camera in the new Filmo 141 movie camera, recently introduced by Bell & Howell. It has a spy-glass type viewfinder provided with a special soft-rubber "bumper" which prevents spectacles from coming in contact with the harder camera material.

This innovation, called the "Spectip," is a shallow soft-rubber cup



Bell & Howell's Continuous Projector (Page 5, Column 1).

circuit containing a radio tube, the EFA automatically controls exposure time for each 35 mm negative in accordance with the negative's density, and is so rapid in its action that it requires but five seconds to complete a print from a negative of average density. It operates on 110 volt, AC or DC current.

The new printer has four lenses, two optically ground and matched condenser lenses, and two lenses combined to form the achromat objective lens. The surface reflector system gives flat field illumination. The use of standard $2\frac{3}{4} \times 4\frac{1}{4}$ ready-cut Bromex paper, proportioned to the 35 mm negative dimensions eliminates trimming and other annoyances. The printer has a perfect fixed focus, which further makes operation easy and simple.

Two levers are provided, one of which sets the timer for hard, medium or soft paper, while the tone-selection lever permits choice of contrast, medium or soft effect as desired. Beyond setting of these levers, placing the paper and touching a button, no further action or judgment on the part of the operator is required.

Automatic accuracy of exposure control is such that from a whole roll of film, bearing negatives of widely varying density, prints of exceptional uniformity are produced. The new Argus EFA brings the advantage of exceptional economy. Standard size $2\frac{3}{4} \times 4\frac{1}{4}$ prints made from 35 mm negatives cost no more when made with the Argus printer, than would ordinary contact prints from negatives of approximately $2\frac{3}{4} \times 4\frac{1}{4}$ size. It is estimated that prints made on the Argus with Bromex paper cost less than a penny a picture. The new printer is rigidly constructed, with an all-metal cabinet, and is mounted on rubber feet for stability during fast operation. It retails at \$35.

Photar Exposure Meter

The Photar, a photo-electric exposure meter of sturdy quality and precision construction, is priced at \$8.75. Compact and convenient to use, it provides excellent legibility with large rapid-calculation dials, and has been proved thoroughly dependable in tests conducted in the Argus laboratories prior to its introduction to the market. Fully licensed under the Weston patents, the Photar conforms to the range of speeds prescribed by Weston ratings, and will go high enough to include the new hi-speed films.

All-Purpose Copying-Bench

A wholly new and ingenious type of equipment for Micro and Macro photography is the Argus Techniscope. Teachers, students, scientists, laboratory workers and amateurs will find in this one combination unit at low cost, equipment which is ideal for taking pictures through the microscope, for making or copying stereoptical slides, for making close-up photographs of small objects, for copying letters, manuscripts and book pages. The new Argus Techniscope is particularly useful in reducing projection slides of old standard sizes and X-Ray films to the new 35 mm miniature standard size.

The sliding focus head, which can be adjusted to vertical or horizontal position on the Techniscope, may also be removed and taken into the field for use with a tripod in photographing small objects.

Enlarging Easel

Argus will soon market a new and more accurate method of obtaining critical focus of enlargers. Claiming that especially in miniature photography the present method of trying to judge the sharpness when focusing with or without a magnifying glass requires mature judgment and is subject to frequent error, Argus announces a system making use of a microscope built into a framing easel through which the actual grain of the emulsion is seen and the focusing is done on the film grain instead of the black and white image as usual.

When focusing with this new device, magnifying power of the optical system is so great that the image is not seen at all, but when the grain of the film becomes sharply visible the image of the negative is automatically brought into the most critical focus on the surface of the printing paper. All guess-work is eliminated and over-exposed negatives so dense that the image can hardly be seen are easily focused with precision.

This new method of grain focusing makes it possible to quickly obtain the most accurate focusing of which any enlarger is capable and, further, gives the operator a control over the amount of grain which is to appear in the final print. Inasmuch as the actual grain of the film is in view when focusing, it is possible to slightly defocus until the grain has just about disappeared without any great loss in print definition. The operator focuses until the grain is clearly visible and then by moving the enlarger lens a few thousandths of an inch either way throws the grain out of focus so that the grain is slightly blurred, while the actual sharpness of the image is not affected.

Amount of magnification used in the system is fifteen times the magnification of the enlarger. In making an 8x10 print from a 35 mm negative magnification is approximately 10. The easel then magnifies this an additional 15 diameters, giving a total magnification used while focusing of 150 diameter. On larger prints where the former method of focusing becomes most difficult, the magnification automatically increases, thus providing greater accuracy where needed.

The Micrograin Enlarging Easel is provided with quick adjusting paper stops which permit the border to be varied to any width. The easel being of rigid metal construction with die-cast framing clamps eliminates any possibility of misalignment.

with its center aperture bonded to the viewfinder eyepiece. Although firmly attached to the camera, the Spectip can be instantly removed when desired.

The cupped shape of the Spectip provides just enough resistance to take up the shock of ordinary contact without damage to the spectacles. It has been demonstrated by many tests that upon mere contact of spectacles with the Spectip, the movie-maker involuntarily adjusts spectacles and eyes to the correct viewfinder sighting position.

An important feature is a knurled edge which prevents the Spectip from acting as a suction cup when in contact with the operator's glasses.

Ampro to Distribute Syncro-Sound 16 mm Camera East of Rockies

AMPRO CORPORATION of Chicago, manufacturers of 16 mm silent and sound motion picture projectors, have just completed arrangements as the exclusive United States sales agents (east of the Rocky Mountains) for the Syncro-Sound 16 mm sound-on-film camera, manufactured by Gumbiner Syncro-Sound, Inc., 3337 Wilshire Blvd., Los Angeles, California. Catering to unskilled operators, the manufacturers claim to have constructed a combination that will give the best professional results and have the greatest flexibility of application with the minimum of operating controls.

The Syncro-Sound Camera has a sprocketless sound drive (an exclusive Syncro-Sound feature) which always insures flutterless recording. A combination carry case and blimp provides extreme ease of set-up and efficiency. Exceedingly flexible—it takes single system pictures on all types of film, and can be synchronized with any camera for double system, or with any projector for recording narrative synchronous with a silent picture. A precision erect image view finder which is optically correct shows exactly what the operator is getting on the film. The set-up has high quality, wide range recording, with good recording from 50 to 6000 cycles. Power requirements are simple as the entire equipment consumes 120 watts from 50 to 60 cycle lighting circuit. For location work a small, lightweight converter may be purchased that will operate the camera from a portable 32-volt battery. The tripod is light in weight, yet rugged enough to support 150 pounds, with double spirit level mounted on the free head. It locks securely and easily in any position and height is adjustable from 32 to 64 inches.

Easily portable, the equipment packs into three black fabrikoid cases with chromium trim. Combined weight of all is 120 pounds. The complete sound picture equipment consisting of camera, amplifier, tripod, two magazines, microphone, one picture lens, carrying case, with all connecting cables, F.O.B. Los Angeles, Calif., is priced at \$2975.

Argus Makes Number of Additions to Miniature Photography Line

IN A FLURRY of activity by the Argus organization a number of new devices were announced by the company last month, all calculated to fit into miniature photography as valuable accessories or time-savers.

Speed Printer

A REVOLUTIONARY new Electromatic Speed Printer, Model EFA, enables the photo finisher and even the most inexperienced amateur to make uniformly correct prints in the new standard $2\frac{3}{4} \times 4\frac{1}{4}$ size direct from any 35 mm double-frame negative. The new fully-automatic Argus printer eliminates much calculation, guess-work and uncertainty.

Through ingenious use of two photo-electric cells and a novel electric

There's a new speed limit in Hollywood

ALL Hollywood is talking about *speed* these days . . . the heretofore unheard-of speed of Agfa's two new 35 mm. films.

The scope of photography, limited by the speed of previously available films, has been extensively widened by *AGFA SUPREME*, which is *twice as fast* as Superpan! . . . and by *AGFA ULTRA-SPEED PAN*, which is *three times as fast* as Superpan!

In spite of its amazing speed, *SUPREME* shows great improvements in grain size, color balance and gradation over Superpan and other comparable supersensitive films.

ULTRA-SPEED PAN, designed for newsreel photography, is being widely used in Hollywood whenever extreme speed is called for.

These two new Agfa films, recognized by the Academy of Motion Picture Arts and Sciences as the greatest contribution to the technical advance of the industry during 1937, are available today. Try them . . . at once!
Made by Agfa Ansco Corporation in Binghamton, New York.

AGFA RAW FILM CORPORATION

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International PHOTOGRAPHER

A JOURNAL OF MOTION PICTURE ARTS AND CRAFTS

NEWS OF THE MONTH

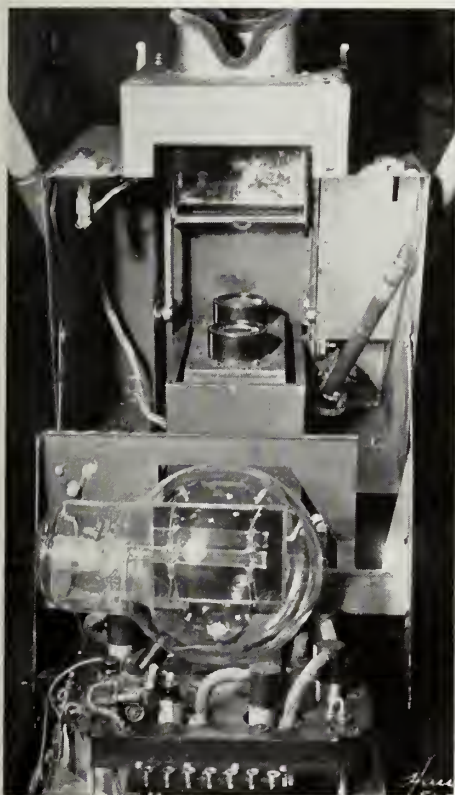


Figure 1

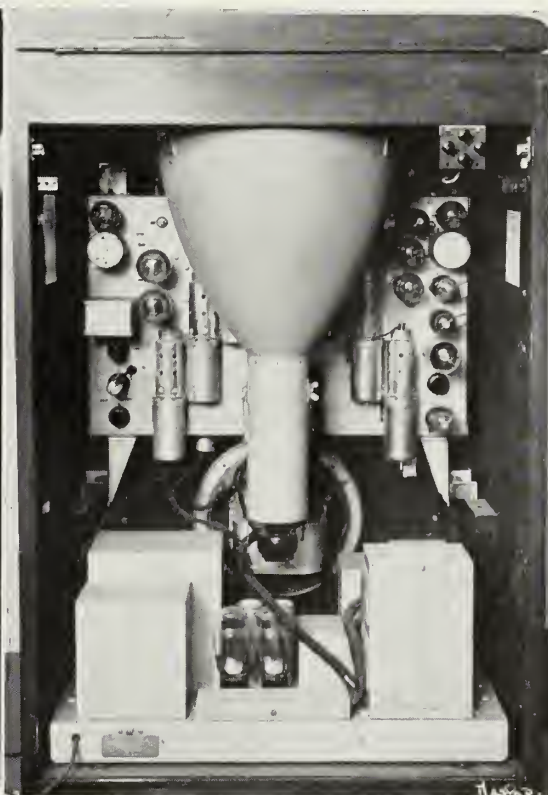


Figure 2

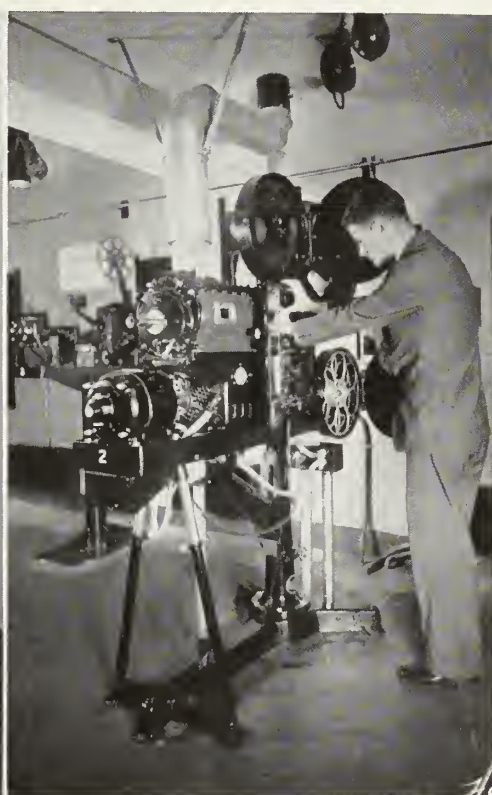


Figure 3

Future of Television

Academy Research Council report, bolstered by expert opinion, indicates television technically "past the corner" but economically still "blocks away"; five to ten years off commercially.

(Two subjects that have taken top space in technical trade journals of the theatrical and allied fields during the past year have been television and color photography. This month's lead story of INTERNATIONAL PHOTOGRAPHER deals with television. Next month we will present a round-up of news and opinion on color, both still and motion picture.—Ed.)

AN ACCUMULATING crescendo of ballyhoo and conjecture about television reached its peak last month with the almost simulta-

neous release of a front page newspaper splash that Paramount had jumped into television with both feet and the annual report on television of the Scientific Committee of the Academy of Motion Picture Arts and Science Research Council. The first development caused considerable pro and con discussion amongst technicians, which now is simmering down to acceptance of the fact that Paramount's venture is fundamentally experimental. The Academy report, cautiously and conservatively worded, puts an

accurate finger on the pulse of television progress.

Reading between the lines of the report, there are to be found two fundamental conclusions, which are supported by independently expressed opinions of a number of experts, who, however, refuse to be quoted.

The first conclusion is that television, technically speaking, is no longer "just around the corner," but is definitely here; but the second conclusion is that economically speaking, it is "blocks away."

Television, all experts agree, is now entering the stage of development where refinements and detail improvements will be the principle objectives of research activity. But from an economic standpoint, all the important factors, upon whose decision the practical commercial application of television depends, stand to gain little and lose

much, including John Q. Public, the ultimate audience.

Neither the radio industry, the major electric equipment manufacturing companies, nor the motion picture industry, stand to acquire anything but red ink and headaches by a precipitate leap into television. Virtually all informed experts are privately in agreement that despite the sensational technical progress of television research, its practical commercial application on any important scale is from five to ten years in the offing.

This pessimistic viewpoint, at least by comparison with the optimistic publicity on television now in circulation, is further supported by the rigid control being exercised over the field by the Federal Communications Commission. Unusually strict requirements are being demanded of those seeking experimental broadcast licenses and the conservative opinion of the important factors, whose tremendous investments might possibly be endangered, is definitely reflected in government circles. The governmental position, of course, is primarily based upon a policy that the public must be protected

from wildcat television merchandising.

From the technician's point of view, all experts are in agreement that Hollywood's army of technical experts will supply the backbone of television production personnel, if and when it reaches practical development; but few there are who will hazard a specific opinion as to its effect upon radio broadcast and theatre personnel in both the managerial and technical fields.

Commencing with this issue, INTERNATIONAL PHOTOGRAPHER inaugurates news and mechanical coverage of television developments with a report by Paul R. Cramer, contributing editor on projection matters, on the status of television in and around Los Angeles.

This resume is followed by the complete verbatim text of the Academy report, which despite its pessimistic view as to any immediate television boom, strongly recommends that the motion picture industry "immediately proceed to a more thorough consideration than has been undertaken in the past of the prospective relationships between television and motion picture production and exhibition."

Latest Developments

By Paul R. Cramer, Local 150 and Local 37, IATSE.

Last month Paramount released to the public the story that beginning January, 1939, they would start broadcasting television, telling us that the Paramount Studios had acquired an interest in the Dumont laboratories in New Jersey, who in turn possesses one of the few FCC experimental television broadcasting licenses, working I believe on a frequency of three megacycles.

This announcement naturally caused considerable comment among the Pacific Coast projectionists, bringing up the question of just how close is this television and what effect will it have on the present day motion picture theatre as well as the industry as a whole?

In checking the situation with expert authorities, I find quite a difference in the opinions of those that are supposed to be "in the know." Naturally, I went directly to the Paramount Studios, but they had no further information to supplement the press release of last month. When I talked to the technicians who will eventually handle this new equipment their answer was "We won't know a thing about it until the New York office drops it in our lap."

My next visit was to H. R. Lubcke, director of television research and broadcasting of the Don Lee Broadcasting System, whose basic station is KHJ, Los Angeles. In answer to a direct question, Lubcke says: "Television is definitely here, receivers are and have been available at a nominal cost (to those who will construct them themselves) but television is not and will not be ready to take its place in the theatre world for another five to eight years.

"It is quite true," Lubcke states further, "that large pictures have been received, but not large enough for use in a theatre. Although very clear and with a minimum of interference, KHJ (as you know) broadcasts pictures over Station W6XAO at 45 megacycles and accompanying sound at 49.75 megacycles. It is received within a radius of 20 to 30 miles with extraordinary clearness, and any reader of INTERNATIONAL PHOTOGRAPHER who desires a complete diagram for a television receiver, will receive one by return mail, if he will send us a large, stamped envelope, self addressed."

In talking with Brothers Meryl Chamberlain and William Weisheit of MGM and 20th Century-Fox, respectively, I found that they both agree television will assist the projectionist rather than put him out of work. Each studio broadcasting television will eventually employ a projectionist to go with each broadcasting crew, mainly because the motion picture technique will be universally used as the accompanying photographs illustrate. As Brother Weisheit reminds us, about fifteen years ago it was said that radio was going to put the motion picture theatre out of business, but instead it has assisted in building the theatre up to its present high standard.

The Hollywood offices of both NBC and CBS were very helpful in providing photographs of up-to-the-minute television broadcasting and reception activities of their experiments at eastern headquarters. Highlights of these are published herewith and with the excellent cooperation of the outstanding organizations now engaged in

television research, we plan to present many more "inside" close-ups on television technique and equipment.

The accompanying layouts on Pages 9 and 11 indicate the progress made in television equipment and its close association and interrelationship with motion picture technique and equipment as described in the report of the Academy Scientific Committee on television, which is published in full in this month's INTERNATIONAL PHOTOGRAPHER.

Figure 1 shows the inside of an NBC television camera. At the center of the intricate apparatus is the Iconoscope, or "eye of television." The rectangular plate plainly visible within the tube is the point where the picture to be transmitted is changed from a pattern of lights and shadows to corresponding electrical impulses. The up-raised portion of the camera shows the lenses used in focusing the scene to be televised on the light sensitive plate, in much the same manner as any other camera. The apparatus below the Iconoscope is used mainly in amplifying the electrical impulses generated on the plate. Several of these cameras are in use in the NBC television studios at Radio City, New York.

Figure 2 shows the rear view of the RCA experimental receiver for both sight and sound. The equipment at the bottom is the power pack, as well as the synchronizing unit. The Kinescope or cathode-ray tube is within the funnel shaped metal shield, having the flurescent screen pointing upward, where the image is reflected to the scanner or viewer by a first surface mirror of high quality, thus giving a larger picture and providing the ability to move the picture up or down without having to move the equipment.

Figure 3 is one that will interest every projectionist. This is a photograph of the modified projection machine used to show motion pictures directly into the lenses of the television camera. The Iconoscope or television camera, is located just on the other side of the wall, where it is insulated from both electrical as well as manual vibrations. Note the extra large shutter mounted in front of the projector lens, instead of between the light source and the lens as is done in the modern theatre, also the placing of the driving motor in the rear of the projector head instead of below. This, I understand, is a modified Acme-Simplex portable projector using an RCA base with extra stanchions for bracing purposes. In the background is another type of projector, the description of which has been promised us for publication in next month's issue of

Figure 4 shows the complete crew shooting a scene, illustrating just how closely they follow the regular motion picture technique, especially in the camera position and method of transporting the camera, also the method of using two or more cameras and their ability to switch from one camera to the other to get a different view of the person or scene being shot. The sound mike and boom are identical to the ones used in the studios at the present time, but the

lighting is somewhat modified. The type of lamp used, the amount of candle power derived, and the number of lighting units used are decidedly smaller and less brilliant than those used in the motion picture studios.

Figure 5 gives an idea of the size of the present large television screen as compared with the average home receiver. Note, however, that the method of viewing the fluorescent screen of the receiver is through a mirror, thereby enlarging the image greatly. This mirror can be set so that the viewer can sit comfortably and still see the image perfectly.

Figure 6 is a simplified diagram of the NBC-RCA television unit. Figures 1 and 2 show the interiors of the two main pieces of equipment indicated in the chart.

Readers of INTERNATIONAL PHOTOGRAPHER who are interested in television may see a demonstration every Wednesday night at 6:30 p.m. at the club house at Plummer Park in Hollywood (Plummer Park is on Vista Street, one block north of Santa Monica Boulevard) where they may see types of receivers used at the present time, and hear a lecture on the construction of them. This demonstration is conducted by the Hollywood Amateur Television Society, a non-profit organization of which G. H. Seward is the president. Seward tells me that he will be glad to send to any reader of INTERNATIONAL PHOTOGRAPHER a schematic diagram for a television receiver with the key to the code of the various resistors, transformers, etc. Seward can be located at the Television Laboratories, 763 North Gower Street, Hollywood, or by telephone at HEMPstead 2567. Be sure that you send a stamped self addressed envelope if you want this schematic by return mail.

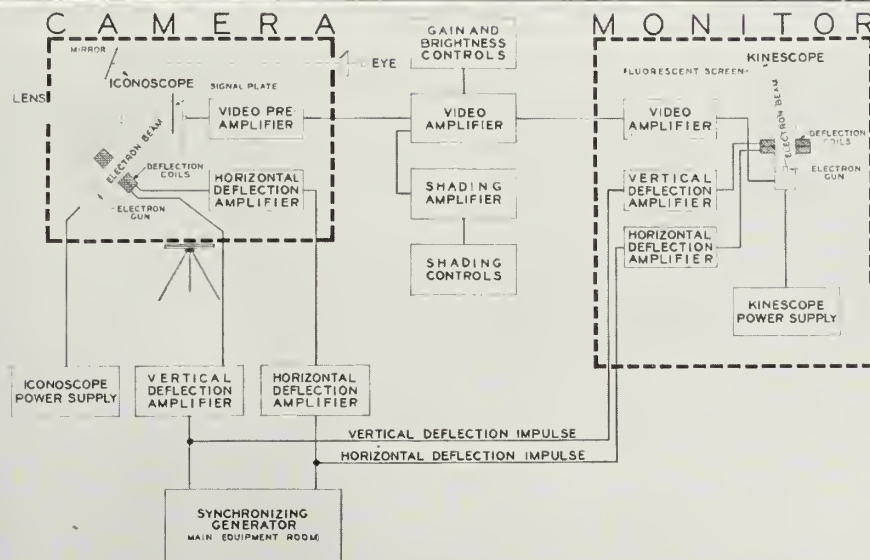
Complete text of the Academy television report follows:

Report's Full Text

The Research Council's first report on the status of television was released on May 15, 1936. The second report followed on June 15, 1937. With the present review we bring the subject up to date, at a time when the period of preliminary experimentation in the United States appears to be on the verge of transition to commercial application.

DEVELOPMENTS ABROAD

ENGLAND took the lead in putting television on a public service basis with inauguration of regular transmission from Alexandra Palace in London on November 2, 1936. Two years have now passed and the results may be assessed. Notable progress has been made on the technical side and in the quantity and quality of entertainment, but these advances have not been reflected commercially. The situation was summed up not long ago in a British headline, "England Leads the World in Television—But Public Won't Buy." It should be added, however, that subsequently the annual radio show at Radiolympia (August 24-September 3, 1938), at which television was the main attraction, appears to have boosted television receiver sales considerably, and according to a current report one visual set (some of which include sound) is now being sold in the London area for every two sound-only receivers. If this is true, and if such a trend con-



SIMPLIFIED DIAGRAM
TELEVISION DEMONSTRATION EQUIPMENT

Top, Figure 4; Center, Figure 5; Bottom, Figure 6.

tinues, then British television is justified in hoping for better days ahead.

Considerable mystery surrounds the question of how many television receivers are actually in use. Estimates in British publications vary all the way from 2,000 to 9,000, depending apparently more on what the writer is trying to prove than on any reliable count. The most probable total appears to lie between 3,000 and 4,000, which, in a population of 10 million within the service area of Alexandra Palace, is a melancholy showing. And yet no one conversant with the situation as a whole can or does regard it as an evidence of failure. The reason is, that while sales have lagged, public interest has been sustained, and where there is interest there is a potential market. That interest is unmistakable, and it has impressed even critical visitors from abroad. Among other manifestations it has expressed itself in a persistent demand for the extension of television service to the Midlands and the North, even while London has failed to justify the expense of what is already offered.

The experience of the British Broadcasting Corporation in this respect gives point to the caution with which American interests have ventured into the *terra incognita* of television. In the United States the cost of nationwide urban coverage is staggering; even in England it is serious. Once the service has been undertaken it is almost impossible to discontinue it, and if it is to be continued, sooner or later it must be expanded. Even if eventually it gets over the top and produces profits and employment, it may for a time dislocate existing industries. Thus in England, together with the agitation for television transmission in the provinces, there are outcries in the trade that television ballyhoo is ruining the sale of sound receivers without creating a compensating market for television receivers. A parallel complaint points to the unfairness of taxing eight million licensees of sound receivers for the maintenance of service to a few thousand owners of television apparatus.

Nevertheless, with all these difficulties, the outlook for British television has its bright spots. The technical progress we shall discuss later. Studio programs have improved, although it is generally agreed that they are still far below the average entertainment level of motion pictures and aural broadcasting. The real achievements—and these account in large part for the unflagging interest in the new art—are visual broadcasts of sporting and ceremonial events. The importance of the Coronation procession televising was referred to in our 1937 report. It has been followed by other events of scarcely less interest to the British public. On June 1 of this year the Derby was televised, and prize fights, boat races, soccer games, tennis matches, etc., as well as the more solemn spectacles featuring the royal family, have been received via radio with general approbation. Whatever the technical limitations may have been, the unique sense of psychological immediacy, the vantage points at which the television cameras may be set up for thousands of eyes instead of the few that can be physically accommodated in such favored locations, and the skillful showmanship with which the events have been scanned, have captured the popular imagination and drowned out the voices of pessimism.

Progress in both transmission and reception, while without revolutionary innovations, has been steady and many-sided. In the field of theatre television, during February of this year Baird demonstrated a mechanical two-color system affording an image 12 feet by nine feet, but with only 8.33 pictures per second and 120-line definition. High-definition television in monochrome was shown by Baird in a Gaumont-British West End theatre, notably on June 1 on the occasion of the Derby broadcasts. The picture was relayed by short wave from Epsom Downs to Alexandra Palace, thence broadcast and picked up at the theatre on a screen eight feet by six feet. The intensity of illumination was low (about

0.75 foot-candle), necessitating the turning off of house lights; otherwise the results were good. A competing company, Scophony, televised the Derby at another theatre. This organization employs an optico-mechanical system of considerable scientific as well as practical interest, utilizing a light-control cell which works on the principle of diffraction through compressional waves generated in a liquid. The method affords higher screen brightness, but appears to be subject to synchronizing difficulties at the present stage of development.

The consensus of opinion among large audiences at these and other demonstrations was that theatre television, while nowhere near the quality standard of 35 mm film projection, had reached a stage where it could add the entertainment value of topical broadcasts to film programs, especially in short-subject houses. British Gaumont Equipments announced last June 3 that television apparatus should shortly be available for theatres at a cost of about 1,000 pounds (\$4,800 at the present rate of exchange) but no installations have been reported. *Apparently the principal obstacle is the refusal of the BBC to permit reproduction of its broadcasts for paying audiences because of copyright complications, while at the same time the Television Act of 1937 makes transmission by radio a government monopoly, and unless amended will not permit a private corporation to broadcast its own pictures to a chain of theatres.*

In the field of home receivers there has been development in opposite directions, viz., larger pictures at higher cost and less expensive receivers at the sacrifice of picture size. The latter are the equivalent of midget sound radios, with two important differences. The midget sound radio, while it has acoustic defects, can be heard all over a room, like a large set. A table television receiver, with a screen from five inches by four inches to 7½ inches by six inches, is suitable only for close viewing by a few persons. A midget sound radio is really cheap. A television midget is still priced at 30 to 40 pounds (\$144.00 to \$192.00 at the present rate of exchange).

Large pictures are available—but at a price. A few examples: a Baird model incorporating a cathode-ray projector, picture size 24 inches by 18 inches, at 157½ pounds (\$756.00 at the present rate of exchange); an Ecko-Scophony mechanical receiver with a picture 24 inches square at 231 pounds (\$1108.00 at the present rate of exchange); a Philips Radio projection type receiver, picture size 18 inches by 14½ inches, at 126 pounds (\$604.80 at the present rate of exchange). It is true that pictures of this size may be viewed by thirty or more people, but they are also most convenient for smaller gatherings. Under the circumstances, however, the intermediate size of picture afforded by a 12-inch cathode-ray tube—10 inches by 7½ inches—is still the rule; these instruments cost in the neighborhood of \$300.00. For those who build their own receivers a cathode-ray tube giving a 12 inch by 10 inch picture is available at about \$75.00. Some sixteen British manufacturers are offering television receivers, but it is evident that even at the peepshow level their product will not assuage the poor man's lot, nor even those in middle circumstances, with taxes at the rate of five shillings to the pound.

On the transmitting end, an eight-studio layout is projected for Alexandra Palace, thus obviating the almost insuperable difficulty of turning out shows from a single studio which must be used for both rehearsal and production. (A second studio is being currently added.) Four Marconi-E. M. I. cameras with greatly increased sensitivity are now used in the studio. The program hours are two a day, three hours on Saturday, and one and one-half on Sunday. The transmission standard remains 405 lines, 50 frames per second, and the Postmaster General announced on January 1 that there will be no

change at least until the end of 1940, thus dispelling apprehensions of receiver obsolescence for three years from the date of the announcement.

For outsid pick-up a second mobile radio unit has been provided. In addition, an equalized cable network is being installed in those sections of London, such as the theatrical district, where televisable events occur most frequently. This will provide an alternative to the radio link and require only a scanning truck at the point of pick-up. A coaxial cable laid between London and Birmingham, and shortly to be extended to Manchester, although designed primarily for telephone purposes, may eventually be used for chain television.

It has been found that under favorable conditions the Alexandra Palace pictures may be viewed at distances of the order of ten times the calculated service range of the station. The normal or optical range is only 25 miles, but authenticated reception has been reported from Ormesby, near Middlesbrough in York, 220 miles from London and almost spanning England from south to north. The pictures have been viewed repeatedly at distances of the order of 100 miles. Such feats require special receiving aerials on hills, and the reliability and quality of reception is necessarily doubtful. However, they indicate the possibility that as additional data accumulates on the propagation of the quasi-optical waves used in television, it may be found that the stations have a somewhat greater service range than has been expected. Thus Alexandra Palace is now regarded as having a useful range nearer 50 miles than 25. Should this prove generally true it would be a matter of no small importance, since doubling the radius quadruples the area covered, and by increasing the population within range of television transmitters would materially reduce economic difficulties of distribution.

GERMANY. At this writing experimental transmissions have begun from a transmitter on the Amerika-Haus in Berlin. The power is between 15 and 20 kw, or approximately the same as London, which is rated at 17 kw. The definition is the same as in the United States, 441 lines, and the frame frequency 50 per second. Two other transmitters are planned, one on the Brocken in central Germany, and one in the Taunus Mountains in the west, all to be connected with coaxial cables. Studios are designed for six-camera operation.

A picture 12 feet by 10 feet has been shown in a theatre by Fernseh A. G., which has a cross-licensing agreement with Farnsworth in the United States. There are also reports of a 700-line image. Cathode-ray tubes up to 26 inches diameter have been built. The cost of receivers is said to range between \$175 and \$1,000, with \$320 as an average.

The Germans have had a television-telephone service in operation between Berlin, Leipzig, and Nuremberg for some time, and this summer the coaxial cable was extended to Munich. Mechanical scanning at 180 lines, 25 frames per second is used, and the reproduction is reported to be considerably distorted and not free from flicker. The principal attraction is novelty. The cost of a three-minute conversation is only RM 4.80 (\$1.92), plus a small charge for notifying the person called; both parties must of course be present at the televising points in their respective cities.

FRANCE. The Eiffel Tower transmitter is rated at 25 kw, which is more powerful than Berlin or London. Its signals have been viewed at Brighton, 180 miles distant. The station transmits daily for 2½ hours. There are reports of a 12 foot by nine foot theatre demonstration, with quality approaching 16 mm projection. We have not come across any information on home receivers or the extent of distribution of programs.

Developments in the U. S.

The RCA-NBC experimental transmissions from the Empire State Tower in New York City were

initiated in July, 1936, and, with interruptions to permit changes in the equipment, have continued since that date. The system operates with 441 lines and 60 frames per second; the general arrangements, a studio-transmitter linkage, etc., remain as described in our 1937 report. A great deal of operating and program data has been gathered and it has just been announced that on the basis of this experience television in the home is regarded as "technically feasible." Accordingly, RCA promises a limited program service and the marketing of receivers before the opening of the New York World's Fair on April 30, 1939. Television transmitters will also be available, and those RCA licensees who desire to manufacture visual receivers will receive the usual technical cooperation.

The NBC television studio in Radio City, New York, is a room 50 feet by 30 feet by 18 feet, no larger than a single medium-sized Hollywood set. A surprising variety of scenery is accommodated in this small space. Since television, at the present stage, is dramatically a close-up art, the sets are small and can be disposed about the room in such a way that while the cameras are shooting one set, another is being moved into place, with a minimum of disturbance, for the next shot. As an example of this economy, in one play a certain door was used, with a nameplate, as the exterior entrance of a residence; subsequently the nameplate was removed and the same door became part of an interior scene—an office in Scotland Yard; finally the whole wall was taken out and the same area became a cellar. Most of the sets consist merely of a back wall with appropriate props in front of it.

The receivers are equipped with screens 10 inches by 7½ inches. Although too small for convenient viewing, the pictures are bright and sharp, and carry sufficient detail to depict emotions, when rather broadly played, in close-up of semi-close-up. Medium and long shots merely show the figures and are used mainly for entrances, exits, establishing settings, etc. (However, when the action is sufficiently dynamic—fights, acrobatics, etc., the long shots do have entertainment value.) In the main, the story must be carried with two-shots; a three-shot is on the borderline of effectiveness. Film takes of exteriors are sometimes intercut to good advantage.

The principal weaknesses of the run of NBC studio productions have been mediocre dialogue, stereotyped situations, and similar remediable faults of material. These have been excused on the ground that as the performances have not been public, the content has been regarded as purely incidental, the essential effort being to determine the visual possibilities of the medium and to solve technical problems. When the material has been up to the mark the results have been definitely entertaining, even with the small screen. One of our members who witnessed some of the demonstrations found it difficult to concentrate on the engineering features—his attention was constantly diverted to the action. This is as good a test of entertainment quality as any.

In June of this year a number of New York department stores demonstrated television reception, using the Empire State transmissions. The pictures were mostly in the five inch by four inch range and the receivers were priced at \$195 to \$225. Public interest was aroused, but only a few sales were reported. The flurry ended when the transmitter shut down for adjustments. The real test of public response will come next year, when regular service is initiated and receivers become available in a number of types and sizes.

Engineering developments in the United States have been mainly in the directions outlined in our 1937 report, and parallel those reported abroad. Progress is slow and laborious, but steady. In general, the advances listed above for the foreign field are either the results of American invention, or they can be duplicated here whenever it becomes expedient.

Demonstrations other than those described above have been offered, but as we have not witnessed any of them we shall not attempt to deal with their results. During 1939 a moderate extension of local television coverage is in prospect in various parts of the country. The Columbia Broadcasting System's Chrysler Tower transmitter (in N. Y. City) is expected to be installed early in the year and to begin regular operation in the spring. A considerable number of applications for experimental television licenses are on file with the Federal Communications Commission, and one of them, which indirectly involves a motion picture company, has just been granted to the Allen B. DuMont Laboratories of Passaic, New Jersey, for a station in that neighborhood. Paramount has purchased an interest in Dumont and advanced an amount, reported to be \$50,000, toward the expenses of research for one year.

In Los Angeles, which, as we pointed out in our 1937 report, may reasonably be expected to carry over into the field of television its importance as a broadcasting and motion picture production center, a station of the Don Lee Broadcasting System has been televising for some years. The present standard is 300 lines at 24 frames per second, visual frequency, and the schedule calls for about eight hours a week, both film and live subjects being scanned. The visual broadcasts of the one kw transmitter are received by experimenters not only in Los Angeles, but in surrounding towns as much as 30 miles away.

The Farnsworth Television System was demonstrated in Hollywood last summer. The picture was in black and white and about nine by 12 inches in size, the image composed of 441 lines and 60 frames per second. The picture was bright and had considerable entertainment value on close-ups. The longer shots were not as effective.

Conclusions

We pointed out at the beginning of this report that the long experimental phase of television development is about to culminate. This does not mean, of course, that experimentation is at an end. On the contrary, the experiment now takes on a larger scope, with the emphasis shifting from technical research (although technical development will simultaneously be intensified) to economic and social aspects. The public, from the role of spectators, will become participants in the project, and on the extent and manner of that participation the effects on the modern picture industry will depend.

That such effects will be evident in the next two years is altogether to be expected. That the repercussions will result in revolutionary changes in motion picture production and exhibition within that period is unlikely. As we have pointed out before, the complexity of the television field and the magnitude of its artistic and financial problems are an automatic brake in this respect, and it might be added that this is true of competitive and cooperative potentialities alike. As regards the latter, when television comes into its own it may well open up a vast market for films especially designed for television distribution. Should competitive factors predominate, it is quite obvious that the strongest interests in the television field cannot afford to ignore their own very substantial stake in the business of aural broadcasting. Although radio is nowhere near the end of its growth, financially it has become a mature industry, mindful of its investment in the present while looking into the future, and this tendency constitutes a protection, if one is needed, for the other entertainment industries as well.

And yet, modern technology has its own dynamic imperatives. It will not and should not stand still. New industries are needed, and if their coming is troublesome, it will be far more troublesome if they do not come. Television is one of them and it is a year nearer. We therefore repeat what we said in our last report; that the situation is one which calls for continual observation and analysis by the motion picture industry, and to an increasing degree as events take their course. Accordingly the Committee is of the opinion that the Academy Research Council should immediately proceed to a more thorough consideration than has been undertaken in the past of the prospective relationships between television and motion picture production and exhibition.

In the opinion of the Committee this investigation should cover the artistic, technical, legal, and economic phases of the subject. Therefore, in order that future activities may encompass all phases of the subject, the Committee recommends that it be enlarged to include representation from those other branches of the industry in a position to contribute a wider background to its consideration.

SCIENTIFIC COMMITTEE: Carl Dreher, Chairman; Gordon Chambers, L. E. Clark, J. G. Frayne, Barton Kreuzer, Wesley C. Miller, Hollis Moyse, William Mueller.

Newsreel Football Specials

Split second teamwork of experienced experts makes possible spotting of special releases in theatres same night of games; bigger and better every year. By Warren McGrath, Local 695, IATSE.

IT HAS BEEN said that football, our favorite autumnal sport, is the most argument provoking of all. Few persons seem able to discuss a game a few hours after the final whistle, and agree on just how the plays were made. Even the thousands emptying from stadiums throughout the country each Saturday afternoon mix traffic bucking frenzy with heated controversy.

But on one point they'll agree—that each season sees the national football fever reach new highs. As a factor of public interest from "border to border and coast to coast" it has no equal. Realizing this the newsreels, ever with a finger on the nation's pulse, have perfected a service that places 200-foot special releases on theatre screens throughout the country with astonishing

speed and photographic quality. While newspaper headlines scream the scores, newsreel patrons see intimate shots of the tricky plays, as an expert commentator, skilled in football lore, explains the action via the sound track.

Each newsreel has its own procedure in covering the grid titanic, but in the main they're very similar, and Bowl-conscious elevens toss sensational passes or present rock-like defensive line play, the newsreel technique varies but little.

Movietone News, for instance, has enlisted the services of Paul Douglas, popular master of ceremonies of the Burns and Allen radio program and a football authority of no mean ability. His voice, recorded on the spot, expertly calls the plays from



Males Undersea

PICTORIAL HIGHLIGHTS of an unusual pairing of spectacular action pictures from one film company are presented from still collections

photographed by Cliff Maupin, member of Local 659, IATSE, and 20th Century-Fox. On Page at left, Maupin captures dramatic action

"Boys"



Girls"

Femmes in Air

from "Submarine Patrol," and on Page at right, "Tail Spin," affords the feminine contingent their quota of melodrama. Note the ex-

ploitation value of these typical stills and how the photographer has captured hints of dramatic story action in each shot.



Left, cameraman Al Brick, member of Local 659, IATSE, and sports commentator Paul Douglas, in action covering grid game for rapid news-reel presentation. Douglas calling of plays on sound track has important part in speedy editing as described by soundman Warren McGrath, Local 695, IATSE, in accompanying story; Right, Douglas, and Jack Darrock, Pacific Coast supervisor for Movietone News, relax between halves at big college game.

the screen as they unreel before you. The newsreel football crew consists of Al Brick, cameraman; Warren McGrath, soundman, the writer of this yarn; Russell Brand, caption writer; and Paul Douglas, narrator. At the end of the half, a special messenger waits to rush the first magazine from the Los Angeles Memorial Coliseum to the 20th Century-Fox laboratories, where it is delivered into the competent hands of Mike Leshing and Henry Goldfarb. At the same time, the caption sheet describing the scenes and identified by a number called and recorded on the sound track at the beginning of each take, is delivered to Pacific Coast Supervisor Jack Darrock.

In an incredibly short time, the developed negative is rolling through the sound Moviola. At the beginning of each scene a number is distinctly heard. It is this number which aids Jack Darrock in selecting the outstanding scenes because caption writer Russell Brand, who called the numbers, has distinctly marked those representing outstanding plays.

Meatime at the stadium, Brick, McGrath, Douglas and Brand are ready to leave after finishing the last half. They rush direct to the laboratory with the final film and soon the best plays of the entire game are assembled in a "rough cut" representing the cream of the day's play. In a projection machine especially equipped to run negative, the rough cut is previewed after which a slight trimming suffices to reduce it to

the required length. With the final cut in the hands of the printer, all hands turn to for a much needed dinner. There is final preview of the finished prints and they are released to messengers waiting to rush them to first run houses.

It all sounds pretty simple when described in order on paper. In reality it is a highly specialized branch of newsreel coverage. Each man has a definite job to do which must be done in a manner gained only from experience. Calling football plays AS THEY OCCUR might seem like a sinecure. Try it yourself some time as you sit and watch a game. It's a GIFT! Did you ever get into one of those arguments on intuition? All you need to become a firm believer is to watch the newsreel cameraman pass up play after play and then deliberately grind on what turns out to be a wow? If you want figures, consider that the average football game is covered in from 1200 to 2000 feet of film. As film goes through the camera at the rate of 90 feet per minute, this then represents from 14 to 22 minutes of a game that takes three hours. And that includes crowd shots, rooting section card stunts, marching bands, etc.

Newsreel film is being increasingly resorted to to decide most issues of importance. Many times, newsreel film is closely scrutinized to determine an issue. Last year Al Brick's film was accepted as the only accurate record of that long pass heaved by Kenny Washington to Hal Hirshon in the

UCLA-Trojan game at Los Angeles Memorial Coliseum. Sports writers were unable to agree on the exact yardage traversed by the pigskin in its aerial flight and that evening a solemn assemblage of Los Angeles' foremost football writers met in the 20th Century-Fox projection room. All were agreed that the yardage was between 70 and 75 but Brick's film, showing the sideline markers, clearly settled the question at 62 yards. Bill Henry, sports editor for the Los Angeles Times, discussing Brick Mueller's famous pass in the Ohio State-California game of some years ago, and other long passes in football history, had this to say:

"Kenny Washington's pass is the first of these stupendous heaves subjected to actual measurement in the movies. The Movietone News film is remarkably clear despite the dusk in the stadium and it will doubtless be accepted once and for all as the longest positively authentic touchdown pass ever completed in college history."

Another point in this connection is that coverage of sensational plays right up to the closing minutes of the game, now is possible through use of the faster new emulsions developed by the film manufacturers. Five years ago it would have been next to impossible to get the Washington-Hirshon pass under light conditions such as existed that November afternoon.

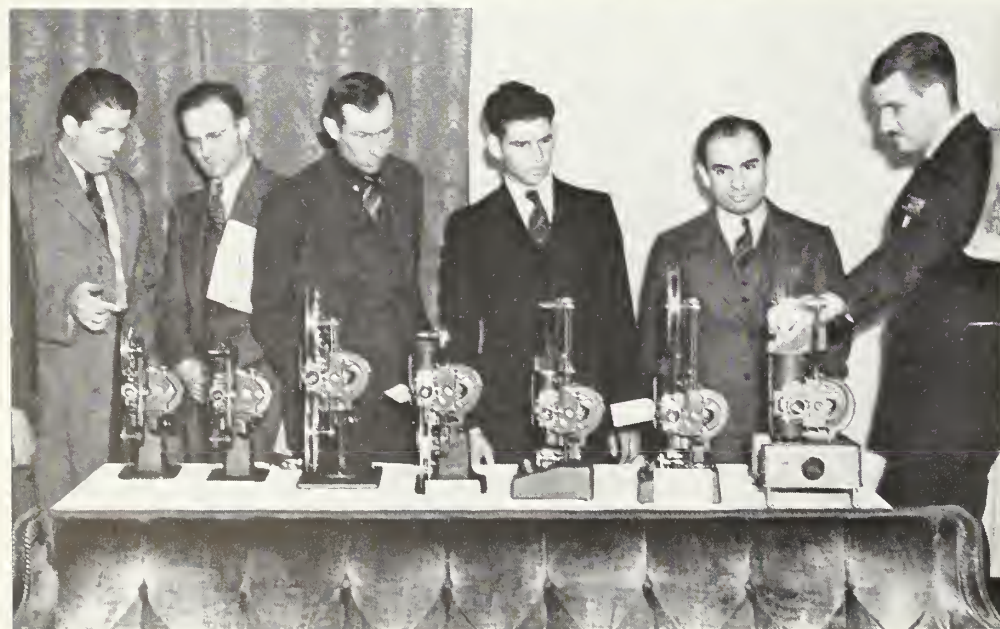
Tests Continue

EXPERIMENTS are still being conducted on the Shirsper system of three-dimensional effect photography, described in the November issue of INTERNATIONAL PHOTOGRAPHER, and results will be published in an early issue.

Three Outstanding **NEW FILMS**

EASTMAN announces three important new negative films for the professional motion picture field. . . . *Plus-X*: fast, fine-grained. Unsurpassed for general studio work. . . . *Super-XX*: super-speed, surprisingly small grain. For difficult newsreel shots, or for use wherever exposure is a problem. . . . *Background-X*: ultra-fine grain, ample speed. For backgrounds. Also excellent for all-round exterior work. . . . These films not only make dramatic advances along their particular lines, but offer the high reliability and photographic quality typical of Eastman sensitized materials. Eastman Kodak Company, Rochester, N. Y. (J. E. Brulatour, Inc., Distributors, Fort Lee, Chicago, Hollywood.)

EASTMAN *Plus-X* . . .
Super-XX* . . . *Background-X



Top, Southern California photographic dealers at Bell & Howell's first annual pre-holiday dinner and exhibition; Center, dealers inspect the big Bell & Howell auditorium projector; Bottom, they look over the array of home projectors.

B & H Fetes Dealers

Pre-holiday annual dinner and showing of equipment to western dealers highly successful.

AN EFFECTIVE forward step in manufacturer-dealer relations was clinched successfully by the Bell & Howell organization last month, when their western district executives entertained the photographic dealers of the Southern California sector at dinner followed by a pre-holiday exhibition of the complete Bell & Howell line and their modern Hollywood branch service plant. So successful was the affair, with almost a 100 per cent response to the invitations, that B&H officials have decided to make it an annual event. Many dealers and their staffs came from hundreds of miles away from Los Angeles to attend.

Handled by H. W. Remerscheid, western district manager for B&H, and E. F. Carlson, western Filmo manager for the company, the dinner and exhibition were marked by an absence of commercial exploitation and by stress upon personal good-will relations. Carlson presided at the dinner at the Mona Lisa restaurant. Principal speakers were Remerscheid, who stressed the desire of every member of the B&H western district staff to establish friendly contact with the dealers; and Bill Winter, president, and Earl Boaden, secretary, of the Southern California Dealers Association, who reported briefly on the organization's past year record in establishing Southern California as a business relations "white spot" of the photographic retail field.

Following the dinner, the more than 400 guests visited the B&H Hollywood headquarters on La Brea Avenue in Hollywood, where in addition to a complete display of all equipment, including many new models and lines upon which there have been recent price reductions, the company's extensive repair service and special engineering facilities were specially arranged for inspection.

Color Print Service

Color Process Laboratories is ready with mechanical wash-off relief prints system.

ANNOUNCEMENT that Color Process Laboratories, located at 837 North Fairfax Avenue in Hollywood, is now in a position to offer a complete service for the mechanical production of color prints from Kodachrome with the Eastman wash-off relief process is made by Friend Baker, veteran Hollywood cameraman, and a longtime member of Local 659, IATSE. The organization is now completing plans to provide complete, rapid service on color prints ranging from the 35 mm Kodachrome to new cut film sizes in the Eastman color film, which have been described in recent TRADEWINDS sections of INTERNATIONAL PHOTOGRAPHER.

Baker, in association with his partner,

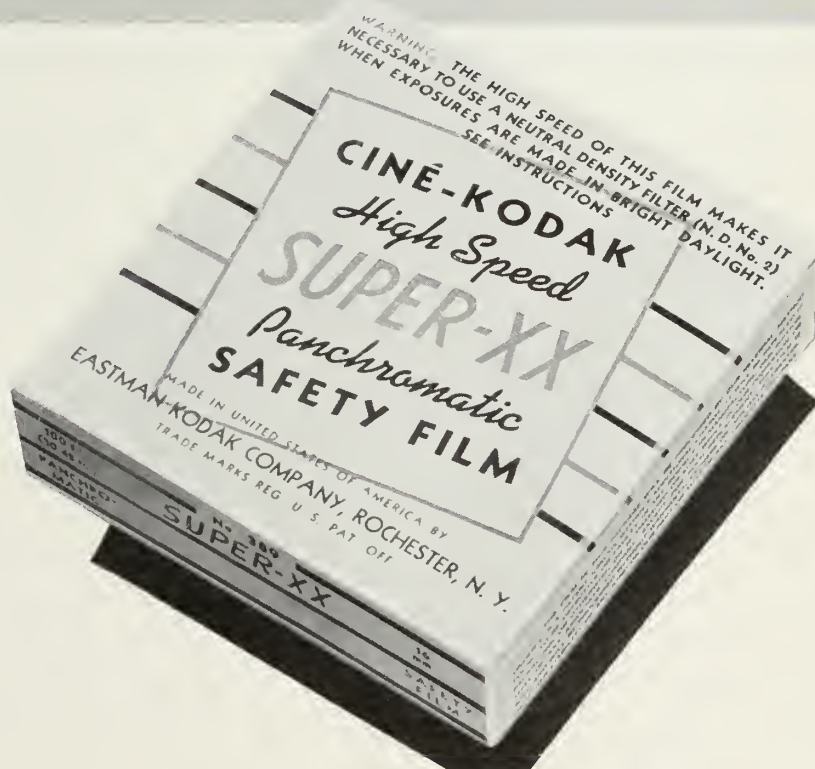
Announcing

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MORE than twice as fast as Ciné-Kodak Super Sensitive Pan, and over four times as fast as regular Ciné-Kodak Pan, this new super-fast film more than doubles the possibilities for making unusual movies under difficult conditions. Good movies much earlier or later in the day... on dark days... in slow motion, with telephotos or color filters, under poor light... of basketball games, skating exhibitions, parties, and other indoor activities... and movies indoors with ordinary room lamps (50 or 60 watts)—all of these are easy with Ciné-Kodak Super-XX.

Super-XX has such great speed that a neutral density filter (N. D. 2) is needed to prevent extreme overexposure when used with bright light. With this filter, having a factor of 4x, Super-XX can be exposed like regular Pan.

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Color Process Laboratories will cater to the studio publicity departments, advertising agency art departments, publishers, lithographers, engravers and the ace professional and amateur photographers with their new service, aiming to set new standards for both price and speed on quality work.

Thomas Expands

Adds new private professional display room to Hollywood Camera Exchange.

CLIFF THOMAS, whose Hollywood Camera Exchange at 1600 North Cahuenga Boulevard, features one of the most complete lines of new and used professional and amateur equipment, has added additional large facilities for display and inspection of professional equipment. The new setup removes the bulkier professional equipment from the amateur and still department, so that professional cameramen and technicians may inspect cameras, dollies, sound systems, etc., more conveniently. Remodeling of an adjoining store space to provide the new accommodations was completed just as INTERNATIONAL PHOTOGRAPHER went to press and a pictorial layout of the new Hollywood Camera Exchange professional department will appear in the January issue.

New Zeiss Plan

THE FIFTH Annual Zeiss Ikon Photographic Exhibition, to be shown in New York after the turn of the year and then in major cities throughout the country, is a departure from the previous ones, in that it will be based on a nation-wide competition, with cash awards. There will be a popular ballot, and prints will be entered in definite classifications.

All entries should be submitted to Carl Zeiss, Inc., 485 Fifth Avenue, New York, and must be in their hands by December 15th.

The exhibition will be divided into three groups: (1) Pictorial Photography, (2) Press and Commercial Photography, and (3) Scientific and Industrial Photography. Awards will be given to the best prints in each classification, a first prize of \$100, a second prize of \$50, a third prize of \$25, and three honorable mention awards of \$10 each.

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New Telco Color

Two color method with radical processing system wins favor with technicians.

SUBJECT OF considerable discussion amongst Hollywood technicians who have picked up inside information on its development is the new Telco color motion picture process. The organization, headed by Bob Hoyt, has been working quietly without any publicity or sales promotion, and has completed and is now editing a full length feature in Telco, "Winds of the Wasteland," exteriors for which were shot in Utah in the vicinity of Zion Canyon.

While a two-color process, Telco is reported by IATSE members who have worked on the production and by other expert studio craftsmen, to have a wide range of pleasing, natural tints, plus unusual sharpness of pictorial quality and depth of focus.

INTERNATIONAL PHOTOGRAPHER is now preparing a fully illustrated layout and description of the Telco color system for publication in our January issue, and because of its unusual and radical processing methods, we believe this will be one of the most interesting articles on color to be published in some time.

Projection Symposium

Spot news on television; equipment review resumes with Thompson on amplifiers and power.

READERS OF INTERNATIONAL PHOTOGRAPHER who have been following our series on modern projection equipment, will find the injection of spot news this month, starting on Page 9, with Paul R. Cramer's roundup of news notes on latest television developments, particularly as they affect the projectionist; along with the full text of the Academy Scientific Committee's report on television progress as it affects the motion picture industry.

The projection series will resume in our January issue with a general discussion of amplifiers and power supplies by W. S. Thompson, of the RCA Hollywood staff. This material, already in hand, is very complete and up-to-date and will be accompanied by 18 charts and circuit diagrams, some of which had not hitherto been available for publication.

Projection Contact

RECOGNIZING the importance of the program which is being sponsored by the studios in connection with the general improvement of sound reproduction and picture projection, the International Projector Corporation has assigned Jack Durst as their factory representative in Hollywood. Durst has been identified directly with the development of the new Simplex Four-Star Sound Equipment. His experience in the industry dates back to 1928.

Salon Postponed

LACK OF SPACE and the decision of the Inter-Studio Camera Club to postpone their announced pre-holiday salon and equipment exhibition, scheduled for December, is responsible for the absence this month of news of the studio clubs. The committee handling salon plans decided that the inter-club organization had not been sufficiently been perfected, particularly in view of the addi-

tion of several recently formed clubs, to undertake such a big project at this time. However, plans for expansion and coordination of the studio camera clubs are being worked out and INTERNATIONAL PHOTOGRAPHER, in accordance with its policy of non-political coverage of studio photographic and technical activities, will accord the clubs news space about their program when the details are decided upon.

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PATENTS

Last month the following patents of interest to readers of INTERNATIONAL PHOTOGRAPHER were issued by the U. S. Patent Office. These selections and brief descriptions of new patents were prepared by Robert W. Fulwider, well-known Los Angeles attorney, specializing in patent and trade mark counsel.

No. 2,131,747—ANTIHALATION BACKING FOR PHOTOGRAPHIC FILM. *Gale F. Nadeau and Clemens B. Starck*, assignors to Eastman Kodak Co. Application Oct. 13, 1937. 10 Claims.

A light-sensitive photographic element comprising a light-transmitting support having on one side thereof a sensitive photographic layer and on the opposite side an antihalation layer of polyvinyl phthalate and a dye.

No. 2,131,778—MEANS FOR PROJECTING STEREOSCOPIC PICTURES. *William H. Wilmot*, Asheville, N. C. Application Dec. 26, 1935. 5 Claims.

A device for projecting stereoscopic pictures to be viewed by transmitted light, which has a pair of concave mirrors facing the screen but at equal and opposite angles to it, and means for projecting a right eye picture on one mirror, and the left eye picture on the other mirror.

No. 2,131,850—MOTION PICTURE MACHINE. *John M. Wall*, Syracuse, N. Y. Original application July 11, 1935. Divided and this application Feb. 23, 1937. 4 Claims.

A shutter for motion picture equipment, which has exposure apertures opening in it, and a closure plate adjacent the shutter arranged so that the effective opening in the shutter can be varied.

No. 2,131,974—SCREEN FOR THE PRODUCTION OF STEREOSCOPIC IMAGES. *Anne Henri Jacques de Lasus Saint Genies*, Versailles, France. Application March 22, 1935. In France March 24, 1934. 3 Claims.

A screen for stereoscopic pictures having three lenticular networks and an unpolished screen surface, one of said lenticular surfaces being between the screen and the observer, and the other two lenticular networks being between the screen and the projector.

No. 2,132,024—FILM REWIND DEVICE. *Jacob M. Goldberg*, Denver, Colo. Application June 23, 1936. 1 Claim.

A film rewinding mechanism having an electric motor drive, and brakes for both reels, the brakes releasing when the motor is turned on and acting when the motor is turned off.

No. 2,132,089—APPARATUS FOR PRINTING PHOTOGRAPHIC SOUND RECORDS. *Denes von Mihaly*, Germany, assignor to six-tenths to the firm Julius Pintsch Aktiengesellschaft, Berlin, Germany. Application March 21, 1935. In Germany June 16, 1934. 4 Claims.

A method of printing a sound record on an endless strip of film by means of passing light through the record film and deflecting it transversely to the direction of the endless film.

No. 2,132,154—METHOD OF PRODUCING COMBINED COLORED AND BLACK AND WHITE PICTURES. *Bela Gaspar*, Brussels, Belgium. Application Jan. 7, 1936. In Germany Jan. 5, 1935. 8 Claims.

A method of producing combination colored and black and white pictures which consists of exposing a film, developing it, treating it with a dye reacting with the metallic silver in the emulsion, reconvert the remaining metallic silver to a silver halide, re-exposing the film, and re-developing it.

No. 2,132,405—FINE GRAIN TRANSLUCENT SCREEN. *Rupert H. Draeger*, U. S. N. Application Nov. 14, 1935. 6 Claims.

A translucent projection screen consisting of a



Lighting News

EXTRA

ON THE SET

EVERY DAY

DUARC TELLS ALL!

JITTERBUG BROADS LOSE GROUND IN STUDIOS

Nobody likes a jittery broad!

Observers of trends and tendencies in Hollywood's studios point to this fact as basis for the present decline in favor of "jitterbug" are broads. "Swing," "rugging" and "jitterbuggery" may still be ace-high among the younger generation, but they are distinctly out of favor with Hollywood's lighting experts.

In circles where "in the groove" refers to a well-cut one rather than a succession of "hot licks," and a "jitterbug" may signify a flickery lamp rather than an exponent of the "Sazy-Q," steadiness, rather than flashy performance is sought. This is particularly noticeable of twin-arc "broad-side" lamps, commonly known as "broadside." A single flicker of a single lamp—unnoticed by the eye—may be picked up by the camera and made the occasion of budget-busting retakes.

DISPLACED BY DUARC

For this reason there exists on all sets where arc lighting is used an accelerating tendency to retire the earlier, jittery are broads and to replace them with the flicker-free Duarc.

An additional advantage to this policy is pointed out by the experts. Previous arcs have required considerable attention and frequent retuning, an especial liability where the lamps are used as overhead "scoops." The longer-burning, dependable Duarc, used for this purpose, can operate without retuning for half a day's shooting or longer. The more modern Duarc doubly speeds production.



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"It is purely a matter of control," the champion stated. "Flicker has always been caused by starvation of the arc. A properly nourished arc—one in which the carbons are fed at precisely the rate they are consumed—cannot flicker. If the feed gets behind consumption—or ahead of it—even the best arc must flicker. If the feed is non-intermittent—jerky—there will be flicker. For satisfactory performance, the feed must be continuous, directly proportioned to carbon consumption.

INDIVIDUAL CONTROL

"Where two arcs are operated together, as in a twin-arc lamp, this means that each arc must be fed independently. The majority of conventional arcs, planned for cheapness of manufacture, have ignored this important fact. Feeding both arcs together, by a single mechanism which usually operates intermittently, they cannot avoid an unproportioned feed—feeding one arc perhaps too late for its needs, the other perhaps too soon. Flicker inevitably results.

"The flickerless performance which has made Duarc the champion can be credited largely to the fact that each of the twin arcs is fed individually, with the carbons feeding with a continuous movement governed directly by the rate at which they are consumed."

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pair of transparent sheets placed in contact with each other, the contacting faces being finely ground.

No. 2,132,893—PHOTOGRAPHIC PRINTING. *John Eggert and Gerd Heymer*, Germany, assignors to I. G. Farbenindustrie Aktiengesellschaft, Frankfurt-on-the-Main, Germany. Application July 17, 1935. In Germany July 24, 1934. 4 Claims.

A method of printing from a strip of lenticular film taken with various focal length lenses and provided with indicating marks where lenses are changed, whereby compensating means are automatically inserted.

No. 2,132,904—SCREEN FOR THREE-DIMENSIONAL PROJECTIONS. *Arturo Martinez, Matteo Martinez, and Angelo Martinez*, Turin, Italy. Application March 20, 1936. In Italy March 25, 1935. 11 Claims.

A screen for stereoscopic pictures consisting of parallel elements curved in two directions, and moved in a direction perpendicular to the elements.

No. 2,133,063—FOLLOW FOCUS DEVICE. *Albert W. Tondreau*, assigned to United Research Corp., Long Island City, N. Y. Application June 24, 1935. 10 Claims.

A focusing finder for a camera with a lens turret wherein the rotation of the lens turret operates a cam to make a corresponding change in the focusing finder.

No. 2,133,076 — TRANSLUCENT PROJECTION SCREEN. *Bernard M. Bodde*, Hollywood, Calif. Original application Nov. 22, 1935. Divided and this application June 15, 1936. 7 Claims.

A translucent picture projection screen comprising a sheet of substantially transparent material free from a light diffusing ingredient in the

body thereof, and a number of minute irregular light refracting particles protruding from the exterior of said sheet and providing a rough surface, the density of distribution of said particles gradually increasing toward the center of said sheet.

No. 2,133,085—TRANSITION OF SCENES ON A MOTION PICTURE FILM. *William V. Draper*, Palms, Calif. Application July 11, 1936. 5 Claims.

A scene dissolve wherein one scene is progressively "fogged out" and the succeeding scene is progressively less fogged until it is free from all fogging.

No. 2,133,121—STEREOSCOPIC SCREEN AND METHOD OF STEREOSCOPIC VISION. *Richard I. Stearns, II*, Chicago, Ill. Application April 2, 1936. 2 Claims.

A method of projecting stereoscopic pictures which consists of reflecting the two images to a series of overlapping angularly positioned mirrors.

No. 2,133,713—PROCESS FOR THE PRODUCTION OF COLOR FILMS AND COLOR PHOTOGRAPHS. *Peter Nespor*, Vienna, Austria. Application May 23, 1935. In Austria May 29, 1934. 7 Claims.

The method of producing colored photographs and cinematographic films, consisting in providing a web of transparent film having arranged thereon successive partial original images and a sensitized surface, and photographing successively the partial image in register with each other on the sensitized surface.

No. 2,133,743—MOTION PICTURE CAMERA. *Otto W. Gibbens, George Kende, and Everett M. Porter*, assignors to Universal Camera Corp. Application Jan. 28, 1937. 9 Claims.

A film wind-up mechanism for motion picture

cameras, which has a plate with outstanding lugs on it, attached to a shaft, and adapted to receive film spool engaging at least one of the lugs.

No. 2,133,820—NON-SLIP FILM PRINTER. *Edward W. Kellogg*, assigner to Radio Corp. of America. Application Sept. 20, 1937. 5 Claims.

A driving apparatus having a driving roller, a member pressing the strip against the driving roller, a second driving roller, and an idler take-up roller.

No. 2,133,937—COLOR PHOTOGRAPHY. *Edmund B. Middleton and Andrew B. Jennings*, assignors to Du Pont Film Mfg. Corp. Application Feb. 15, 1937. 27 Claims.

A color-forming photographic developer comprising an aromatic amino photographic developing agent and an acylacetaminoarylmorpholine.

No. 2,134,266—COLOR PHOTOGRAPHY OR CINEMATOGRAPHY. *Edgar Sanders-Dolgoruki and John Hubert Reindorp*, England, assignors to True-colour Film, Limited, London, Eng. Application April 7, 1937. In Great Britain Sept. 23, 1936. 3 Claims.

A method of coloring photographic images comprising removal of the developed silver image and treatment of the colored image-carrying layer or layers in an aqueous solution containing not over four per cent of phenol.

No. 2,134,483—APPARATUS FOR PRINTING MOTION PICTURE COLOR FILM. *Robert T. Killman and Thomas A. Killman*, Nashville, Tenn. Application Nov. 16, 1936. 1 Claim.

A step printer for printing color film in which the negative film is advanced two frames at a time, and the positive film one frame at a time, both films advancing simultaneously and only when the pressure plates are released.

TECHNICAL ARTICLES

New Eastman Emulsions

Advance technical data on sensational new emulsions

By *Emery Huse and Gordon A. Chambers*, Eastman Kodak Company

(This authoritative compilation of technical data and practical production suggestions is by two well-known members of the Eastman Kodak technical staff that cooperates closely with studio technicians. It will be published and circulated by that company and is first published in International Photographer without any editorial changes or excisions.—Ed.)

THE HISTORY of the development of the art of making motion pictures is extremely interesting, particularly so in some of its technical aspects. Outstanding among these technical considerations is the negative photographic emulsion which has undergone a tremendous change during the past twenty-five years.

The year 1913 marked the introduction of panchromatic motion picture negative films. Prior to this time motion picture films were but two in number, comprising a single negative emulsion, and a single positive emulsion on which prints were made. Generally speaking the same type of panchromatic emulsion was manufactured and sold until 1928 when the first motion picture series of panchromatic emulsions, known as Type I, was manufactured by the Eastman Kodak Company.

The year 1928 marked a definite turning point in the technical side of the motion picture industry, because it was in that year that the most notable advances were made which lead up to current practice. Aside from the introduction of panchromatic motion picture negative film for general use, sound photography was given its first chance in dramatic pro-

duction. Likewise, studio lighting began its metamorphosis from arc lamps to mazda lamps. Prior to 1928 there has been very little panchromatic negative film used. Introduction of mazda lighting equipment at the same time that panchromatic film was being generally advocated provided an incentive toward more complete use of this type of film.

During the year 1928 it was found necessary to make an improvement in the panchromatic type of emulsion then in use which revealed itself as a faster and somewhat softer emulsion. This film was known as Type II. It was not until February, 1931, that the first radical departure was made in the panchromatic negative emulsion, for it was at that time that the first of the Super-Sensitive types of panchromatic film was introduced by the Eastman Kodak Company. This film was known to the trade as Super-Sensitive Panchromatic Negative, and it was adopted quite generally for use in motion picture production almost immediately after its introduction. This Super-Sensitive type of film was materially faster and finer-grained than its predecessor, and for the first time it gave the cameraman a much better tool with which to work. Likewise, it considerably enhanced the quality of his photographic endeavors.

Two years after the introduction of Super-Sensitive Panchromatic Negative the Eastman Kodak Company introduced an entirely different type of panchromatic emulsion to the motion picture trade. July, 1933, marked the first appearance of Eastman Background Negative. This emulsion was one of very high quality photographically resulting from an extremely fine grain emulsion structure. It was approximately one-half the speed of Super-Sensitive Negative. The purpose for its introduction was to fill a needed field in the art of projection background work, and it was not long before this emulsion was generally adopted as the medium on which projection background plates were photographed. Prints from these negatives are projected onto a background screen in front of which dramatic action is photographed in a composite scene.

March, 1935, marked the advent of a new and improved panchromatic negative. This film became known as Eastman Super X Panchromatic Negative film. It was somewhat higher in speed than its predecessor, Super-Sensitive, gave much less graininess and provided a marked improvement from the standpoint of photographic quality. At the time of this writing

(over three years later) Super X Panchromatic Negative is in general use in the motion picture industry.

However, on October 24, 1938, the first of another improved panchromatic motion picture negative film was introduced to the motion picture trade under the name of Eastman Plus X Panchromatic Negative film. This film has twice the speed of Super X, finer grain, and similar developing characteristics, all lending themselves to finer photographic quality. It is felt that this film will, in a relatively short time, replace Super X Negative.

One week later two other panchromatic films, again quite different in characteristic, were introduced. One of them known as Background X represented a modified background negative type. This film has about twice

the speed of regular Background negative, or approximately 75 per cent of the speed of Super X. It has less contrast than the Background Negative, and approximately the same grain characteristics. It is felt that this emulsion will be adopted generally as an exterior film for general motion picture work.

The other film, known as Eastman Super XX, is an emulsion of extremely high speed, and with a grain characteristic comparable to the Eastman Super X Negative. This Super XX film has a speed four times that of Super X Negative, and from the standpoint of its speed this film may be considered a special product from many standpoints.

Technical Data

A.—SENSITOMETRIC CHARACTERISTICS.

A complete technical analysis of a negative emulsion involves a study of the many sensitometric characteristics among which are such items as speed, contrast, color sensitivity, grain, etc. The conventional manner of displaying data resulting from emulsion comparison is in the form of sensitometric curves. To this end exposures were made on the group of films under discussion in an Eastman Type IIb Sensitometer using the conventional negative setup. These exposed films were developed using a negative developing solution of the type employed in motion picture practice in a machine conforming generally to the principles involved in an actual developing machine. Probably the best first-hand information concerning these three new Eastman emulsions as they line up with respect to the current Background and Super X Negatives is to study the group of sensitometric curves presented in *Figures 1 to 7*. The times of development for which curves are given, were times within the range where normal sensitometric contrast could be obtained. In *Figures 1 to 3* there is a direct comparison for Eastman Super X, Plus X, and Super XX films. Since a gamma of 0.70 is considered normal, it will be observed that under the conditions of these tests, that gamma was obtained in approximately the same time for the Super X and the Plus X, namely, nine minutes. For the Eastman Super XX, 16 minutes was required. It must be borne in mind at this point that these times of development should be considered only in a comparative manner, and not as actual developing times to be used under production conditions. Difference in developer formulas or in machines with their own peculiar agitating system will alter to some extent the actual time values to obtain a fixed gamma. Likewise the ratio of developing times between different emulsions is subject to variation.

Figure 4 presents the time-gamma curves of these three emulsions. It will be observed that curve "A" is drawn to represent the time-gamma characteristics over the range of times studied for both Super X and Plus X. An examination of the actual gamma values obtained on *Figures 1 and 2* will show negligible differences between these two emulsions, hence the presentation of one curve for both films. This means that practically identical developing conditions now in vogue for Super X can be applied to the Plus X type.

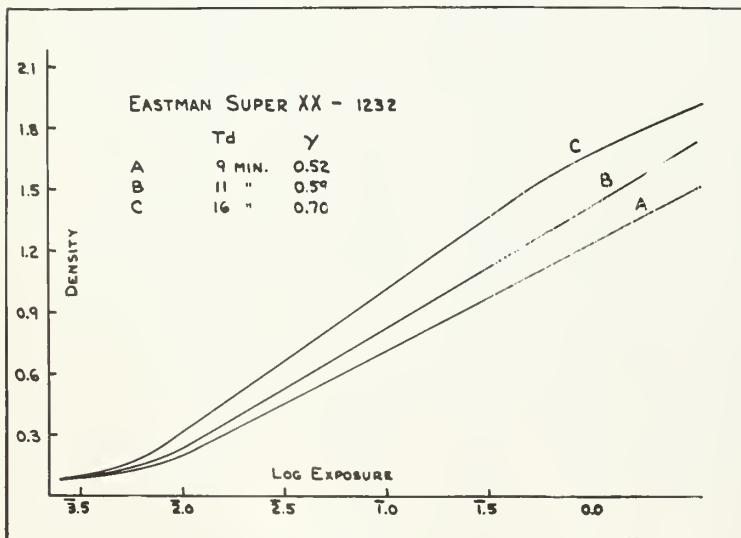
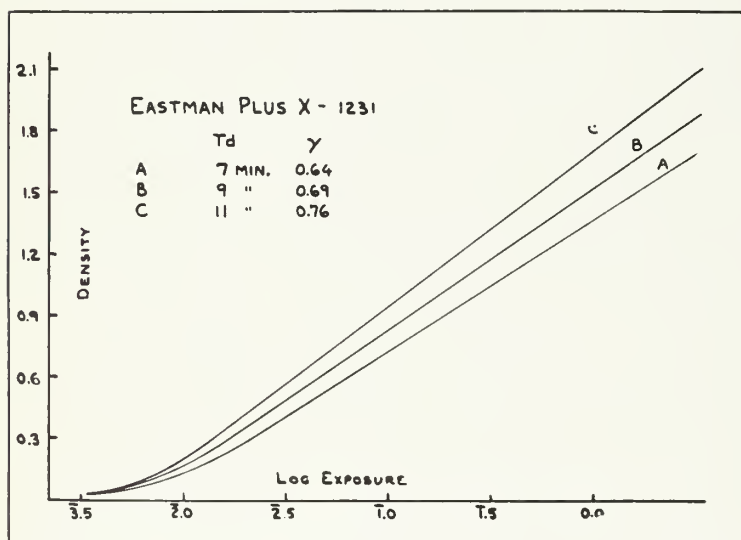
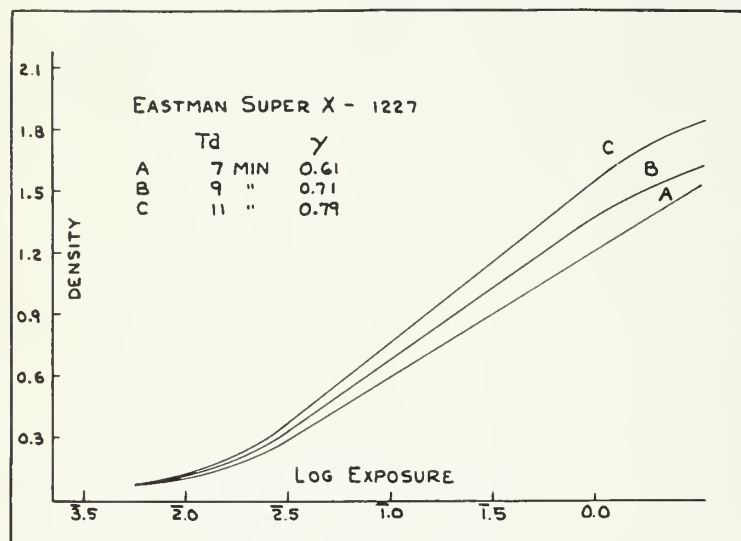
Curve "B," *Figure 4*, shows the time-gamma characteristic of the Eastman Super XX emulsion. This is the emulsion of extremely high speed and as is usual with such high-speed emulsions the developing time factor to arrive at a gamma of, let us say 0.70, necessarily has to be increased.

Figures 5 and 6 show the sensitometric curves for a series of times of development for the Background and the Background X Negatives. Since the Background X is of inherently lower contrast than the Background, longer times of development were necessary to produce the same gamma. In practice Background Negative is used at a gamma of approximately 0.80, and it will be observed by study of the time-gamma curves in *Figure 7* that this gamma is reached under the condition of these tests in six minutes for the Background Negative, and 10 minutes for the Background X. Again it should be brought out that these times are relative and apply only to these tests. The relationship between these emulsions, therefore, may vary somewhat for other developer formulas and machine conditions.

B.—SPEED.

With the accepted Hurter and Driffield method of sensitometric analysis, which has been described in previous publications, it is relatively simple to compute speed values for various photographic emulsions. The speed of a photographic emulsion depends upon several factors which involve the type of developing solution, type of developing machine, and the degree of agitation during development in that machine. Therefore, for a group of emulsions under test these various factors must be kept constant. It is then possible to make mathematical computations of speed which can be expressed in a definite ratio. By applying the Hurter and Driffield procedure definite speed values have been determined for the new negative emulsions, as well as for Background and Super X Negatives. The following table gives the ratio of speeds between these various emulsions with Super X Negative expressed as 100.

FILMS	RELATIVE SPEEDS
Background Negative	35
Background X	75
Super X	100
Plus X	200
Super XX	400



Top, Figure 1; Middle, Figure 2; Bottom, Figure 3.

Considerable interest has been shown in very recent years on the estimation of speed by photo-electric exposure meters which are not available on the market. The most outstanding of these meters are the Weston and General Electric Exposure Meters. There is relatively little difference in the final results obtained with these two meters provided the meters themselves are in good condition, and the user applies some intelligence to his attempts to use them. Numerous tests have been made and it is felt that the values presented in the following table for both daylight and tungsten exposure conditions apply equally well to the Weston and General Electric meters.

FILMS	DAYLIGHT	TUNGSTEN
Background Negative	12	8
Background X	24	16
Super X	32	20
Plus X	64	40
Super XX	128	80

Again it must be borne in mind that these values cannot be rigidly applied, but must be used with an element of common sense.

C.—COLOR SENSITIVITY.

From the standpoint of color sensitivity these three new Eastman films are fully panchromatic, and while differing slightly from Super X Negative in that there is somewhat higher green speed, they are insufficiently different to cause a realignment in the filter factors for the various common filters used in cinematography. Figure 8 shows the wedge spectrograms of the three new emulsions together with Background and Super X. The following table gives the filter factors for those filters most commonly used in motion picture practice:

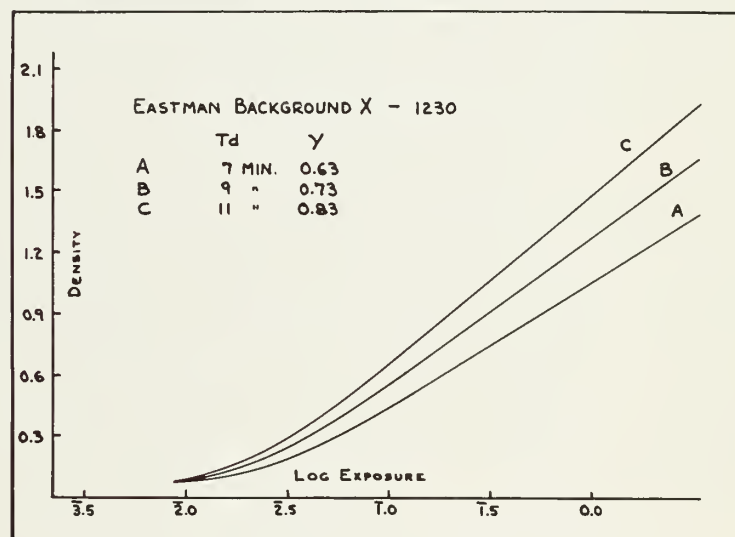
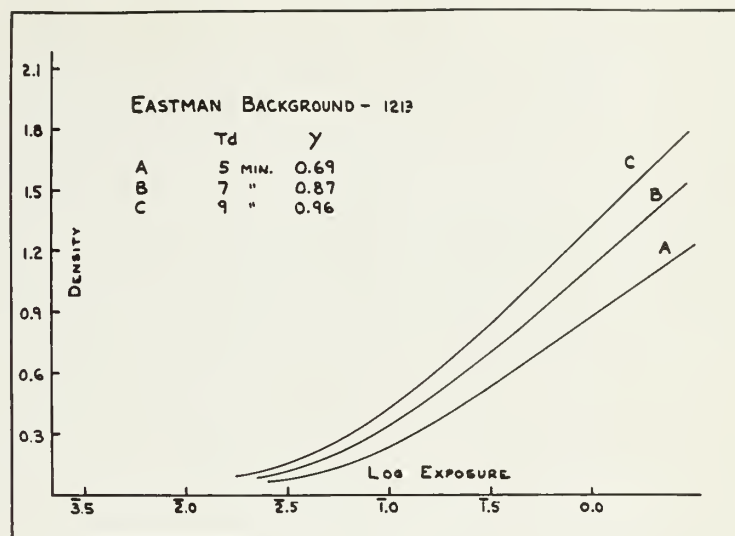
FILM	FILTERS					
Background X	1.25	1.5	4	5	3	4
Plus X	Aero 1	Aero 2	3N5	5N5	G	23A
Super XX						

D. Graininess differences between two emulsions are often expressed on a quality basis, that is, one exhibits more or less graininess than another in the case of two films being compared. Technically these differences can be shown by photomicrograms made from uniform areas of silver deposit of the same density developed to the same gamma. These photomicrograms presented in Figure 9 show the structure of the graininess. Generally, however, the relationship between the graininess of any two emulsions as revealed by the photomicrograms is evident in the practical tests as examined on the screen. It is interesting to note that actual production and experimental tests on the various films showed that the order of graininess as revealed by the photomicrograms is evident in the picture tests. In the order of relative graininess these various films may be classified as follows: Background Negative, Background X, Plus X, Super X, and Super XX.

A word of explanation is necessary here because one would expect that the grain size gradually increased from the Background to the Super XX. Tests show quite conclusively that there is relatively little, if any, difference between the Background and the Background X. The Plus X shows slightly more graininess than the Background Negatives, but is definitely less than that revealed by Super X. On the other hand, there is a just perceptible difference between Super X and Super XX with the Super XX showing slightly more graininess. However, picture tests on the screen have to be examined with extreme care to detect this difference. As a result, there are but three degrees of graininess presented by these five films. The *very fine* grain structure being represented by the Background and the Background X; the *fine* grain structure by the Plus X; and the *normal* grain structure by the Super X and Super XX.

E.—DEVELOPMENT.

It was pointed out briefly when discussing the sensitometric characteristics of these various emulsions that development can play an important role in the estimation of the value of a negative emulsion. It was shown by the sensitometric curves that Super X and Plus X have very nearly identical characteristics in this respect. The Background X shows an improved characteristic over the Background Negative in that the Background X requires slightly longer developing time. The only departure from normal developing procedure is shown by the Super XX film. When it is realized that the Super XX is an emulsion of four times the speed



Top, Figure 5; Bottom, Figure 6.

of Super X, it is not surprising in view of current manufacturing knowledge that this emulsion with its high speed should require longer than normal developing time when based upon Super X Negative as a standard. An increase in developing time of approximately 50 per cent will take care of the Super XX film.

F.—Fog.

It has often been the rule rather than the exception that the faster, or more sensitive an emulsion is, the greater the tendency toward increased development fog. It is extremely interesting to note in the case of these three new films that when compared with the current films they all show less tendency to produce chemical fog upon development.

Recommendations

This simultaneous introduction of three new negative films by the Eastman Kodak Company marks the first time in the history of emulsion manufacture when so many, and such different, negative materials were introduced to the motion picture trade at one time. These three new films are markedly different from any existing products manufactured by the Eastman Kodak Company. It is therefore, quite in order to offer some recommendations as to the uses to which these films may be put, and to give an indication of the field in motion picture practice to which they are applicable.

1.—BACKGROUND X.

While this emulsion carries the same general name as Background film which is now in use it is not necessarily intended that this film completely replace Background Negative. However, since there is practically no difference in the graininess characteristics of these two emulsions it is probable that in many instances Background X will be used in place of the regular Background Negative. The most outstanding reason for this is its lower contrast characteristic.

The fact that Background X is a faster emulsion than regular Background Negative opens up another possibility for use which may prove very important. There has never been a film introduced to the motion picture trade with the recommendation that this film be used exclusively for exterior photography, but since the speed of this Background X is approximately 75 per cent that of Super X, this emulsion naturally falls

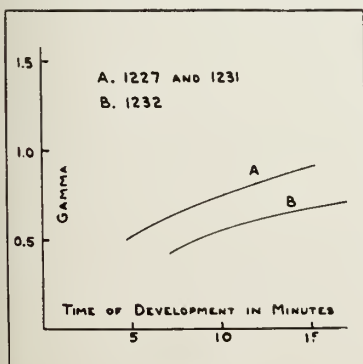


Figure 4

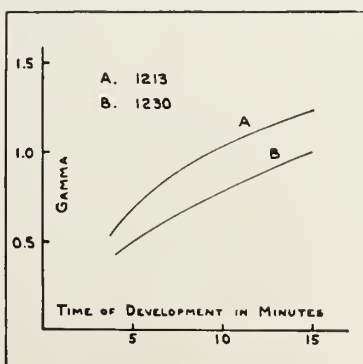


Figure 7

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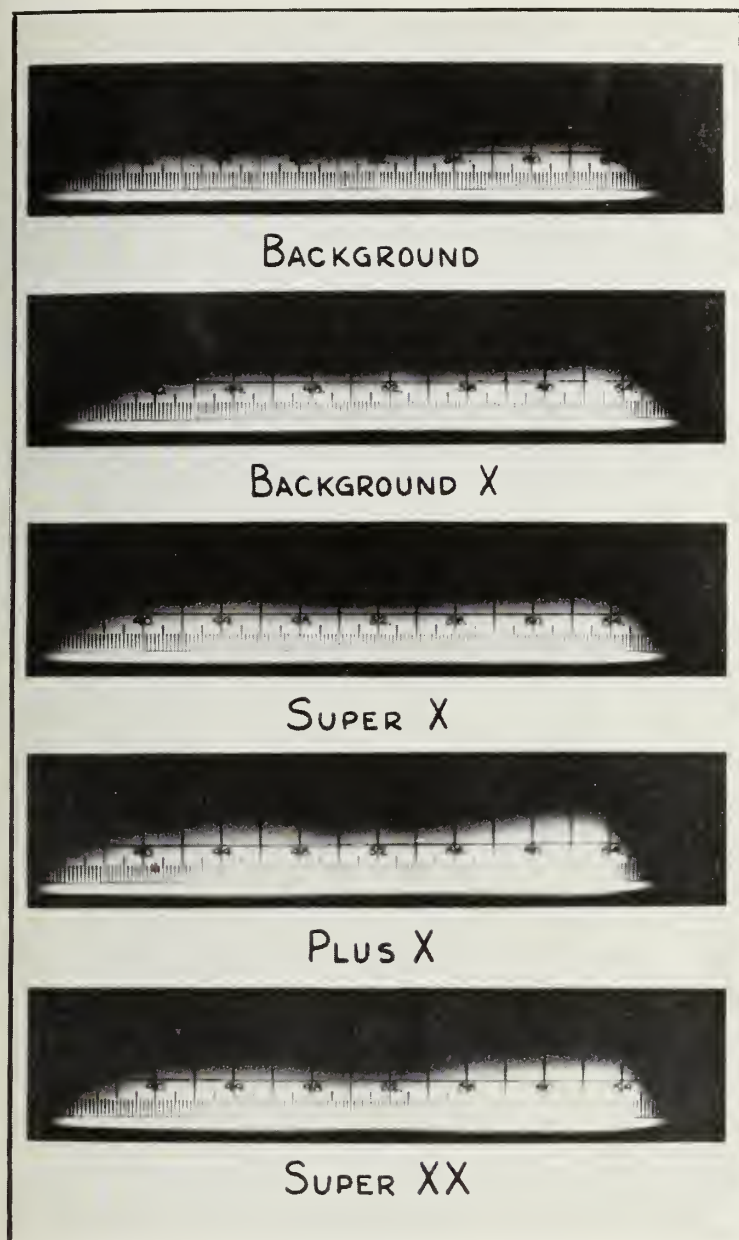


Figure 8

into that category. Added to this is the contrast characteristic which is but slightly higher than Super X, and the grain structure which is nearly identical to Background Negative. These three factors, therefore, make it possible to recommend the use of Background X for normal exterior motion picture production.

2.—EASTMAN PLUS X.

This emulsion is in a sense to be considered as a replacement for the Super X Negative. Up to this time there has been no condemnation of the Super X, and the presentation of the Plus X type was not made because of weaknesses in the Super X type. However, there have been requests for films of higher speed than Super X, and this emulsion, therefore, fits into that category. In the light of past emulsion knowledge it was not possible to make an emulsion faster than Super X without increasing the graininess characteristics, but with the advance in emulsion knowledge it has become possible to make a faster emulsion with even less grain. This is exactly the case with the Plus X emulsion. Previous paragraphs of this paper definitely prove that this Plus X emulsion with its double speed over Super X is of finer grain characteristics than the Super X. These two factors, therefore, make it imperative that this Plus X emulsion type be used in place of Super X. It should be stated too that the finer grain structure definitely lends to a finer photographic quality.

This emulsion, Plus X, should be used for interior photography, there being no necessity except under adverse lighting conditions to use a film of this speed for general exterior photography, for to accomplish it it would be necessary to alter lens stops, employ diffusion discs, filters, etc., for decreasing the effective exposure. There is no need for this with the films now available.

Another field in which the Plus X emulsion can be used to great

advantage is in the making of the composite projection background scenes. With the speed of this new Plus X film it will be possible to stop down the lens and thus carry greater depth of focus and generally enhance the photographic quality. This film will prove of decided advantage over Super X for this work.

3.—SUPER XX.

As indicated in previous paragraphs this emulsion is one of exceptionally high speed and excellent photographic quality. The prime purpose behind the manufacture of this emulsion was the desire to give the cinematographer every possible advantage that film speed could give. News reel men particularly are often confronted with the necessity of photographing historical events under extremely poor lighting conditions. Camera lenses, and camera speeds, cannot be materially altered at this time. Therefore, the only possible chance of obtaining good photographs of certain events is dependent upon the negative emulsion's ability to pick up light intensity of low value. It is felt that this Super XX film will accomplish this.

There are also many conditions arising in the cinematographic art where high emulsion speed is needed. Often such conditions arise in actual studio practice. Since the graininess characteristic of the Super XX emulsion is not appreciably greater than the Super X emulsion now in current use, there is no reason at all why cameramen should hesitate to make use of this film when the need arises. It is unnecessary to add that this film should prove very useful for the photographic recording of boxing or wrestling matches, or any kind of sport or assemblage where the only light available is the general floodlighting condition of the auditorium type.

Conclusions

It is hoped that the facts and discussions contained herein relative to the three new Eastman Negative films will enable any interested cinematographer to make successful use of them.

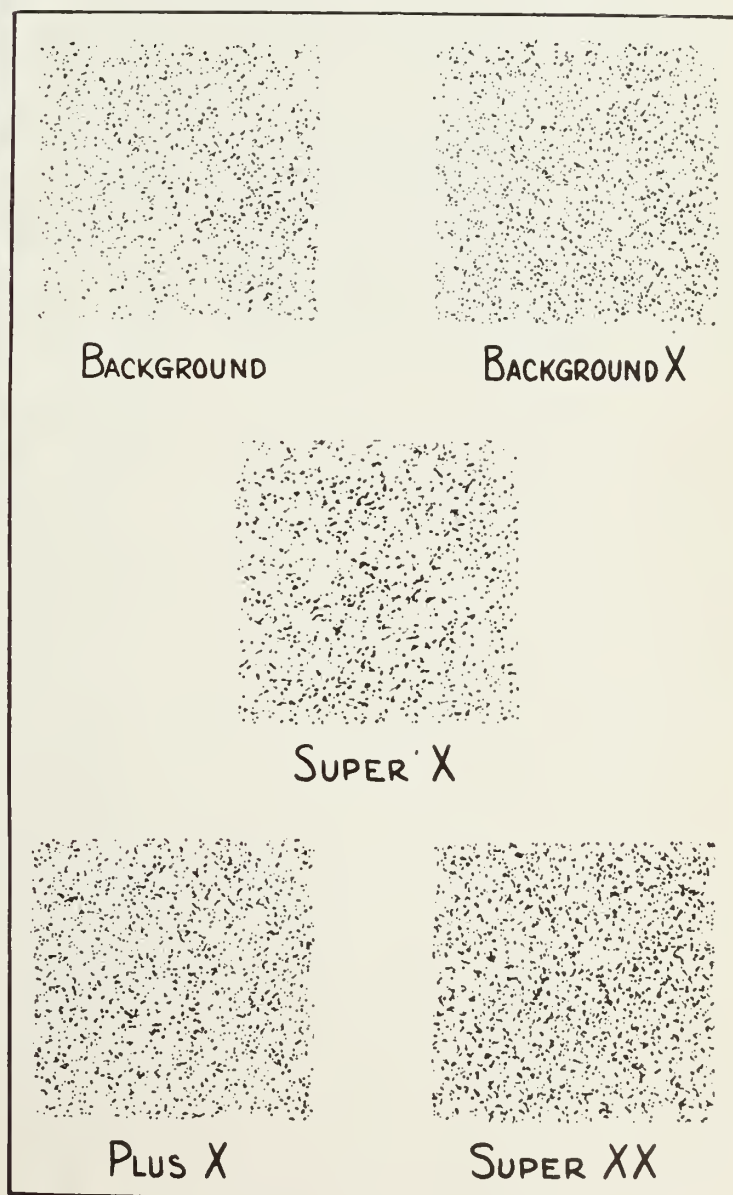


Figure 9



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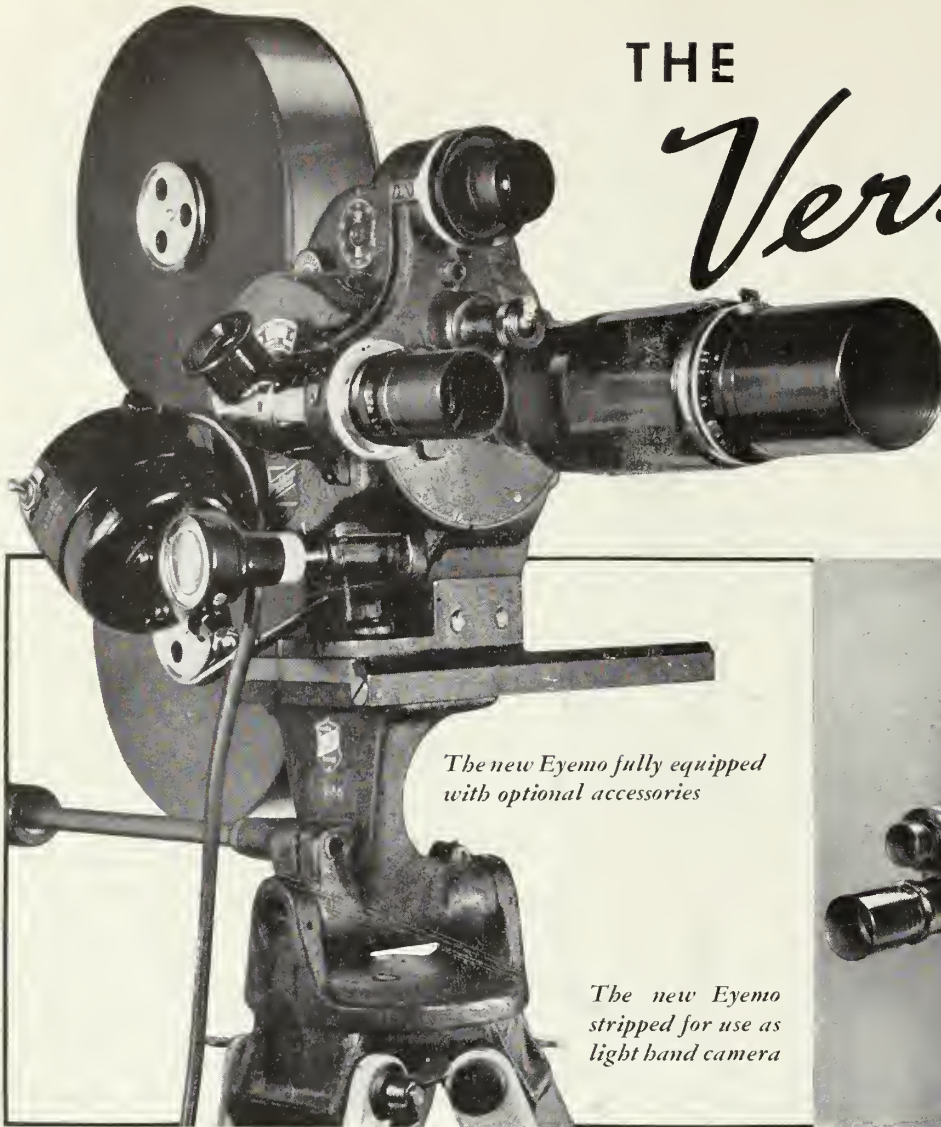
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